Issued: 21 March 2022
JRC MARS Bulletin Vol. 30 No 3

European Commission

JRC MARS Bulletin

Crop monitoring in Europe

March 2022

Fair start to spring

Dry spell remains a concern in southern regions

After a predominantly mild winter, winter crops entered spring in fair to good condition in most of Europe, and weather and terrain conditions allowed for a good start to field operations. However, continued dry conditions in south-western Europe remain of concern. As it is still early in the season, the crop yield forecasts reported in this issue of the Bulletin are – with a few exceptions - based on historical trends.

Winter cereals in southern parts of the Iberian Peninsula have been negatively impacted by drought, and present suboptimal growth. In southern France and north western Italy, crop development is still in the very early stages and winter crops are not yet or only slightly impacted. To avoid reduction of yield potential, rain is also needed in most of the rest of Italy, as well as in Slovenia, Croatia, Hungary, Romania and south-western Ukraine.

Continued drought conditions in the Maghreb region have severely impacted yield potential, and even caused crop failure in parts of Morocco.

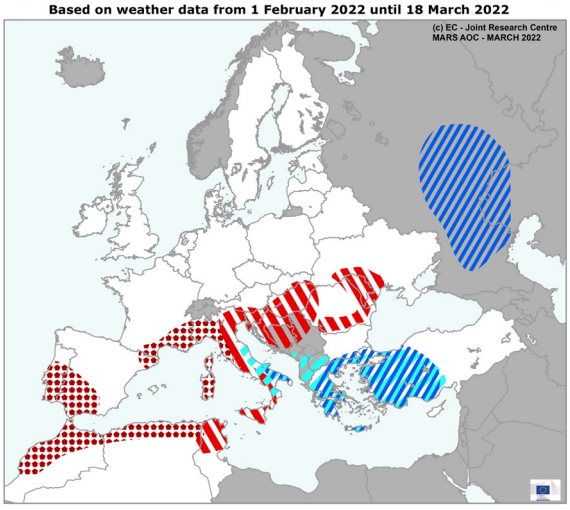
Cold and wet conditions along the Italian Adriatic coast, Greece, and Turkey delayed crop development, but favourably replenished soil moisture. The precipitation surplus in European Russia is also considered favourable for crops.

Contents:

Covers the period from 1 December until 10 March 2022

AREAS OF CONCERN - EXTREME WEATHER EVENTS

Based on weather data from 1 February 2022 until 18 March 2022



Crop	Yield t/ha				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
Cereals*	5.42	5.65	**5.60**	+ 3.3	– 0.9
Total wheat	5.61	5.81	**5.80**	+ 3.2	– 0.2
Soft wheat	5.84	6.04	**6.02**	+ 3.1	– 0.3
Durum wheat	3.52	3.54	**3.60**	+ 2.2	+ 1.5
Winter barley	5.75	6.08	**5.83**	+ 1.5	– 4.1
Rye	3.90	4.17	**4.19**	+ 7.6	+ 0.6
Triticale	4.19	4.42	**4.37**	+ 4.2	– 1.1
Rape and turnip rap	3.07	3.20	**3.22**	+ 4.6	+ 0.6

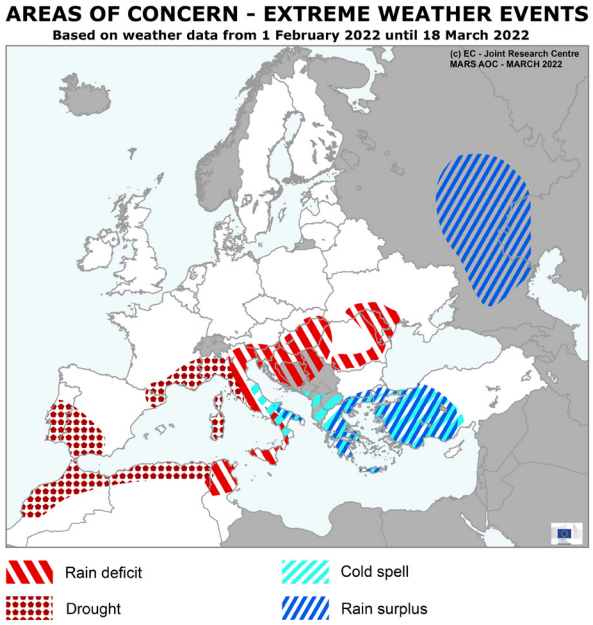
Issued: 21 March 2022

* Only the cereals specified in the table are included

Joint Research Centre

1. Agrometeorological overview

1.1. Areas of concern

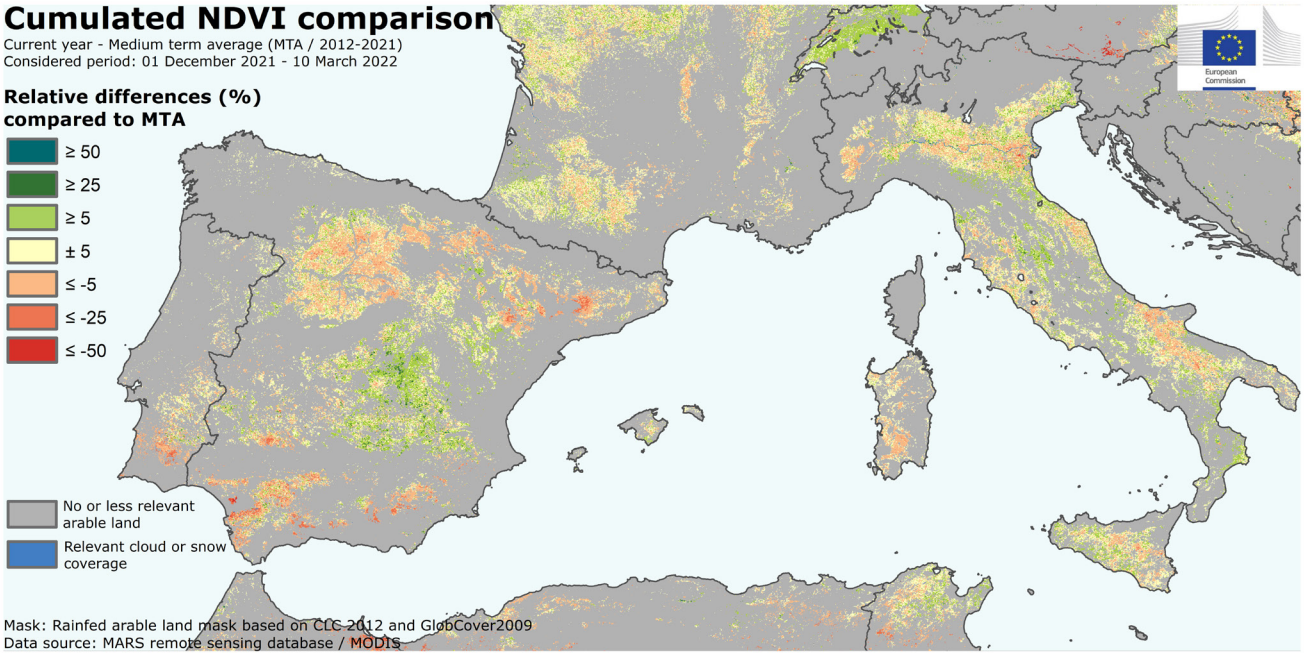


Drought conditions continued in large parts of south-western Europe. In southern parts of the Iberian Peninsula, winter cereals are negatively impacted and present suboptimal vegetative growth (dark red colours in the remote sensing map below). In south-eastern Spain, recent rains partially replenished soil moisture and alleviated water stress on crops. In southern France and north-western Italy, crop development is still in very early stages and winter crops are not yet, or only slightly impacted. Since January, most other parts of Italy have presented a substantial rainfall deficit, and abundant rainfall is needed in the coming weeks to avoid a significant reduction of yield potentials. Dry conditions are also unfavourable for the sowing of summer crops, while the low levels of water reservoirs (i.e. snowpacks, and inland water bodies) are causing concern about water availability for irrigation in late spring and summer.

Continued drought conditions in the Maghreb region have severely impacted yield potential, and even caused crop failure in parts of Morocco.

Dry conditions in February and March have also been observed in southern-central Europe (Slovenia, Croatia, Hungary), Romania and south-western Ukraine. In these regions spring regrowth of winter crops started only recently; the dry spell may reduce yield potentials if not soon interrupted.

Cold and wet conditions are observed along the Italian Adriatic coast, Greece and Turkey. These conditions delayed crop development (e.g. in Italy), but on the other hand replenished soil moisture. The rainfall surplus in European Russia is considered favourable for crops.



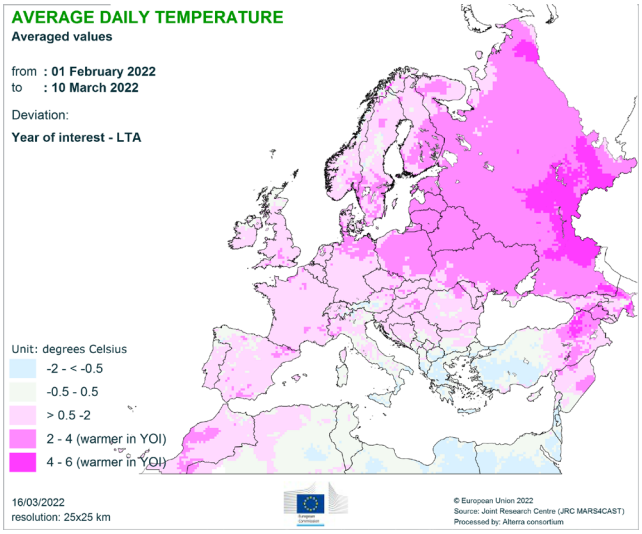
1.2. Meteorological review (1 February –10 March 2022)

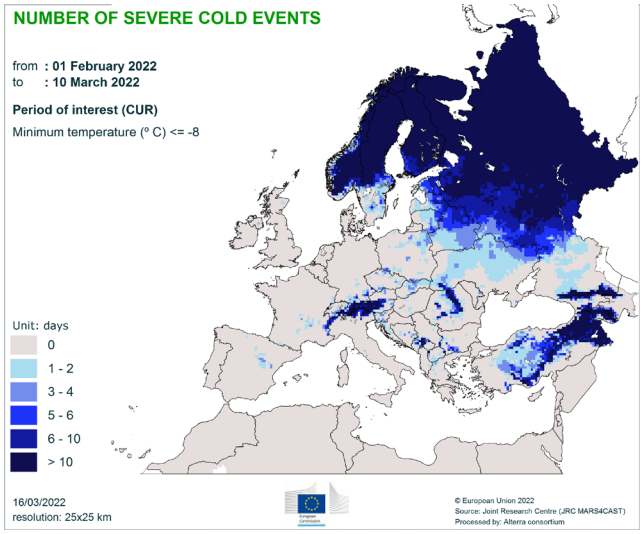
Warmer than usual conditions, with daily mean temperature anomalies (with respect to the LTA) from 2 °C to 4 °C. were observed in northern-central and eastern Europe. Almost all other parts of Europe presented slightly warmer-than-usual conditions, with daily mean temperature anomalies up to 2 °C. The number of severe cold events was much lower than usual in almost all parts of Europe where these normally occur during this period, and essentially absent in most parts of western, central and southern Europe with relevant agriculture.

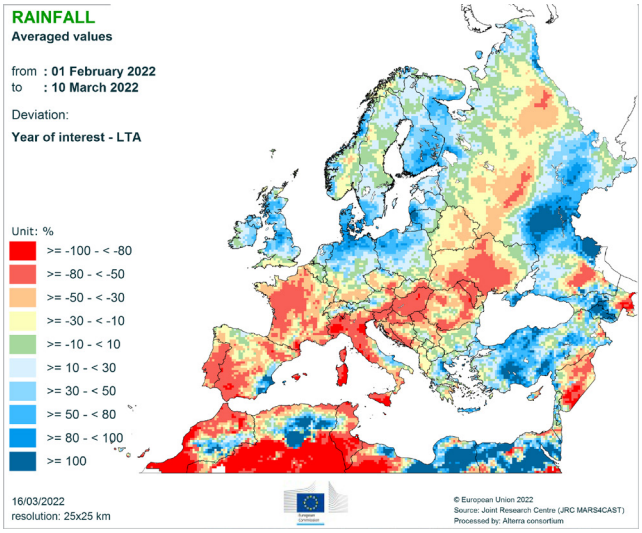
Slightly colder than usual conditions were observed in the eastern Mediterranean region, including southern Italy, Greece, and western and central Turkey. Daily mean temperature anomalies in these regions ranged from -2 °C to -0.5 °C.

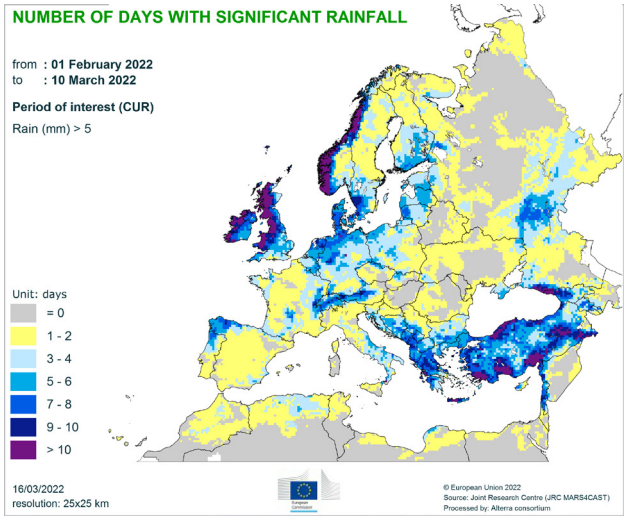
Wetter than usual conditions were observed in a large belt, covering Ireland, the North-Sea, and the Baltic Sea region; associated with a series of Atlantic storms in the first three weeks of February, of which Eunice (also known as Zeynep or Nora) with wind gusts locally reaching close to 200 km/h, was the most severe. Considering the review period as a whole, precipitation anomalies in this region ranged up to +80% with respect to the LTA. Another belt of distinctly positive precipitation anomalies (regionally exceeding +100% with respect to the LTA), associated with more evenly spread rain and snow events during the review period, extends from the eastern Mediterranean, across Turkey and the Black Sea into eastern Ukraine and Russia.

Drier than usual conditions were observed in most other parts of Europe, with the most distinct anomalies (less than -50% with respect to the LTA) in south-western and northern parts of the Iberian Peninsula, large parts of France, Italy, Slovenia, Croatia, Hungary, Romania, Moldavia, central and south-western Ukraine, and some parts of central and southern Russia.







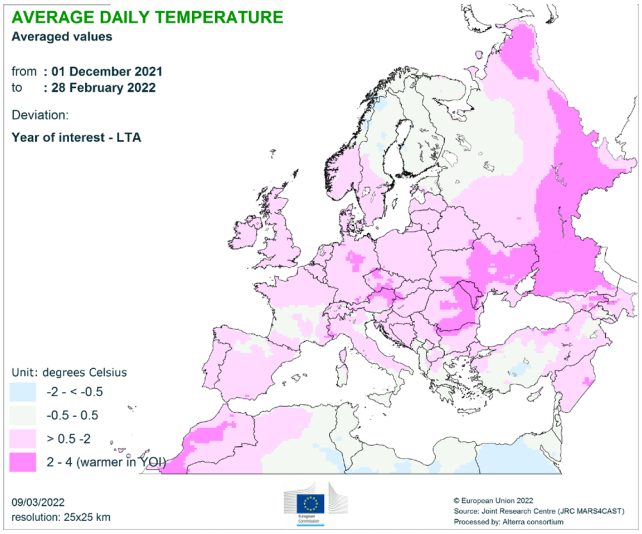


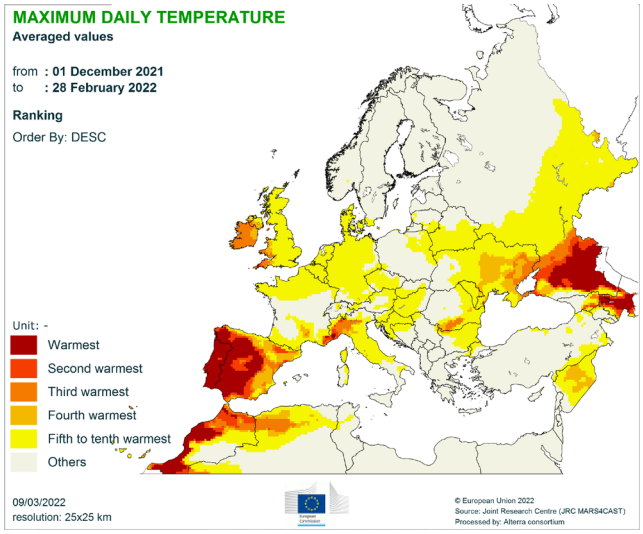
1.3. Winter review (December, January, February)

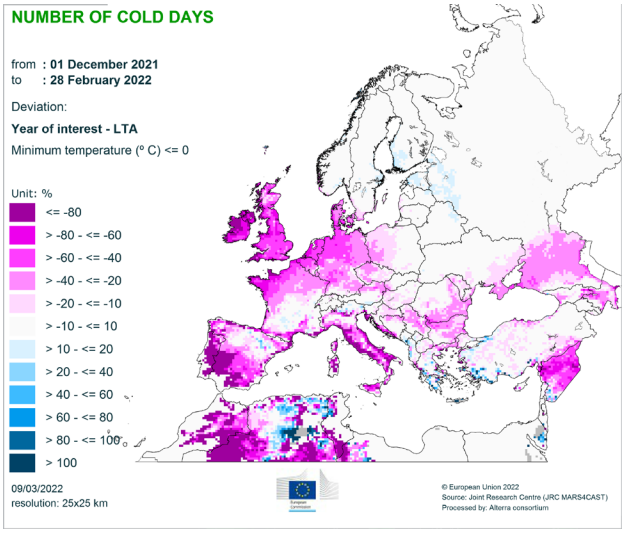
Warmer than usual conditions were observed in almost all parts of Europe. In most regions, daily mean temperature anomalies (with respect to the LTA) ranged from 0.5 °C to 2 °C. More distinct anomalies, up to 4 °C, were observed in parts of Germany, Czechia, Austria, western Romania, Ukraine and eastern European Russia. Average daily maximum temperatures during winter were among the highest on our records (since 1979) in the Iberian Peninsula, Ireland, north-western Italy, eastern Ukraine, and southern Russia. In most of these regions, as well as in most other parts of western Europe, a consistent reduction in the number of cold days (with daily minimum temperature below 0 °C) was recorded. The number of severe cold events (with daily minimum temperature below -8 °C) was much lower than usual in almost all parts of Europe where these normally occur during this period.

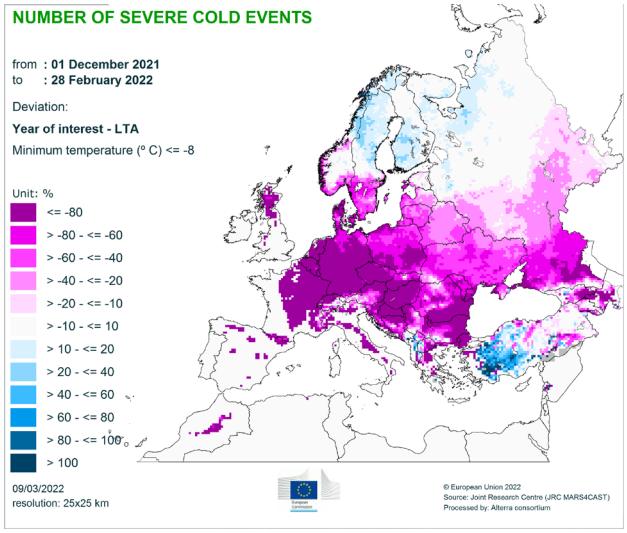
Drier than usual conditions, with precipitation anomalies between -80% and -30%, were observed in the Iberian Peninsula, the Maghreb region, the Mediterranean Isles, and a belt extending from southern France, across northern Italy and Slovenia to Hungary; as well as in south-eastern European Russia. Because of the combination with above-average (maximum) temperatures and radiation, the climatic water balance in these regions was among the lowest on our records.

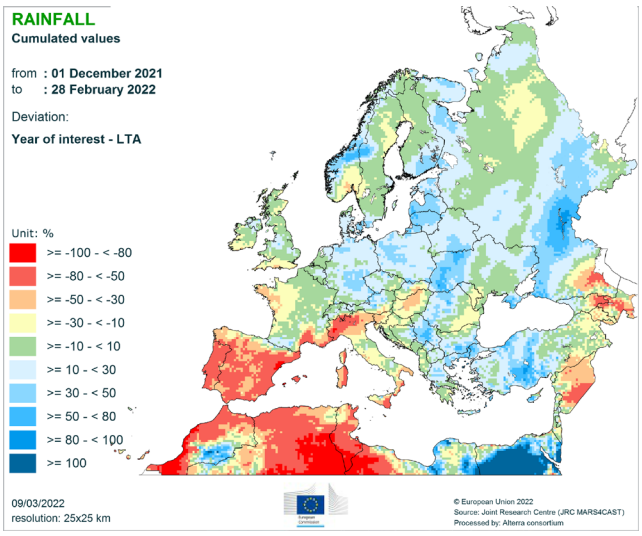
Wetter than usual conditions were observed in Germany, Poland, the Baltic countries, a north-south belt extending from Belarus to Greece and another one from eastern Russia to central Turkey. Anomalies in these regions were mainly up to 50% with respect to the LTA, and associated with distinct periods of abundant rain or snow-fall, alternated with dry periods.

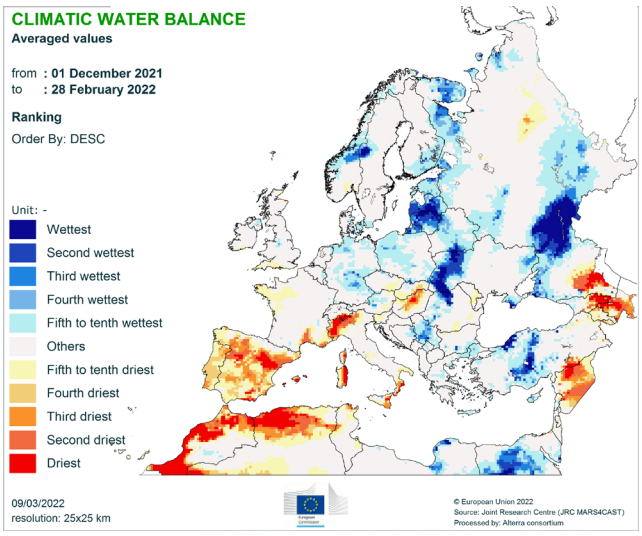




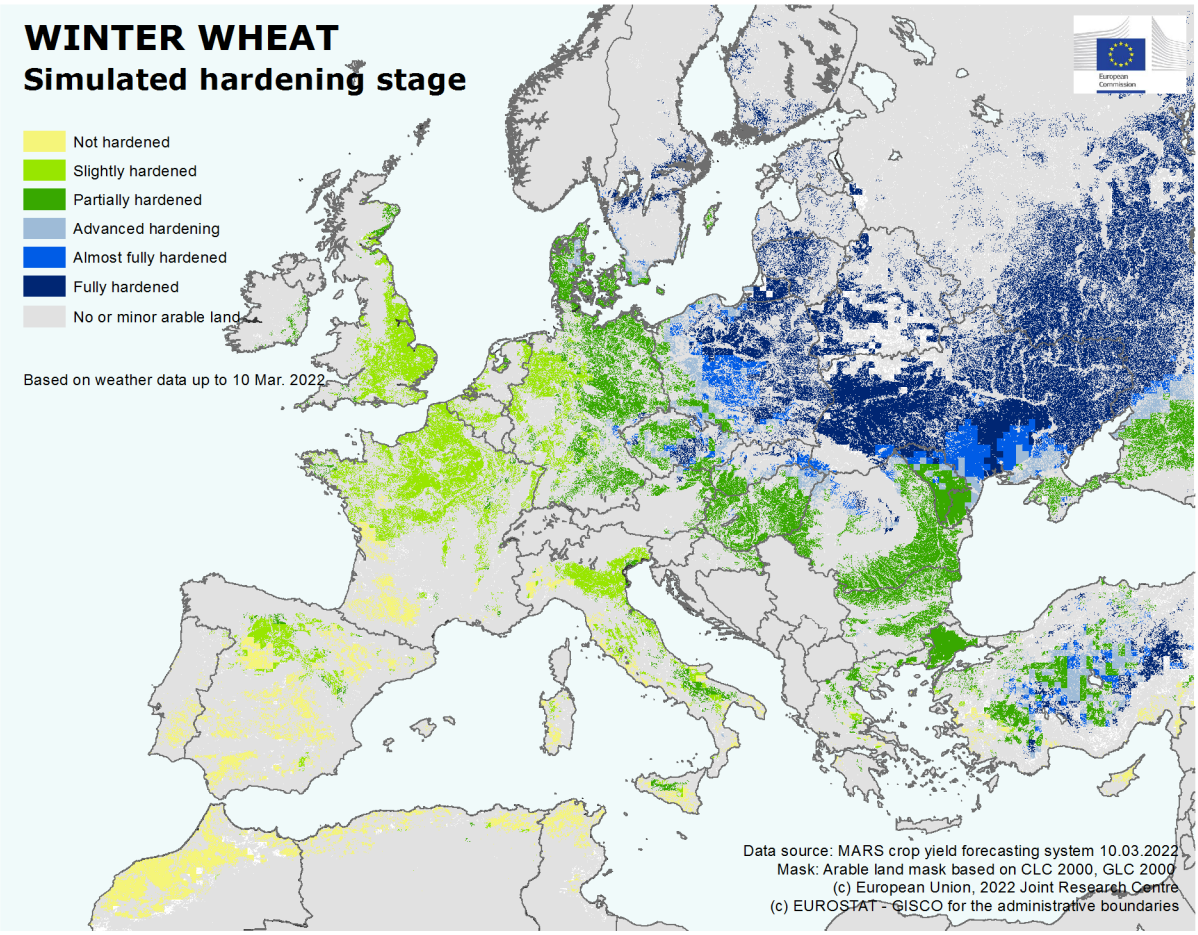





RAINFALL
Cumulated values
from : 01 December 2021
to : 28 February 2022
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
09/03/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


CLIMATIC WATER BALANCE
Averaged values
from : 01 December 2021
to : 28 February 2022
Ranking
Order By: DESC
Unit: -
Wettest
Second wettest
Third wettest
Fourth wettest
Fifth to tenth wettest
Others
Fifth to tenth driest
Fourth driest
Third driest
Second driest
Driest
09/03/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

1.4. Winter hardening and frost-kill analysis



Hardening is the biophysical process whereby winter cereals gain low-temperature tolerance to withstand freezing conditions that occur during the winter dormancy period.

Due to the prevailing warmer-than-usual temperatures during the period under review (from 1 February to 10 March), our crop model did not simulate any frost damage to winter cereals. Hence, only negligible damages are expected to have occurred in late January around the Black Sea, as mentioned in the February issue of the Bulletin.

The de-hardening process has continued in the Iberian Peninsula, where crops are almost not hardened anymore, except for some areas from northern Spain. The same process has been observed in western France and winter cereals resumed their vegetative growth.

Compared with the situation reported in the February issue of the Bulletin (up to 10 February), our crop model simulated a de-hardening of the winter cereals around the Black Sea; most distinctly in Romania, Bulgaria, and the southernmost parts of European Russia.

The current weather forecast (19 to 25 March) shows a cold air intrusion in eastern and south-eastern Europe. This might lead to minor frost damage in some parts of southern Russia, where minimum temperatures are expected to drop below -12 °C.

1.5. Weather forecast (19-25 March)

The weather conditions in the forecast period will be determined by a stationary cyclonic disturbance over south-eastern Europe and the Aegean Sea and by two cyclones approaching the Iberian Peninsula. These atmospheric patterns will bring moderate-to-intense precipitation mainly in the Iberian Peninsula and in the northern part of Morocco. Precipitation events are also expected in large areas of south-eastern Europe, the eastern Mediterranean and the Black Sea region. This atmospheric circulation will also favour colder air intrusion over eastern Europe, the eastern Mediterranean and the Black Sea region, with minimum temperatures expected to drop below -4 °C in large areas and below -12 °C in some regions of Turkey and Russia.

The long-term forecast for the coming months (April, May, and June) points to very likely to extremely likely warmer-than-usual conditions throughout Europe.

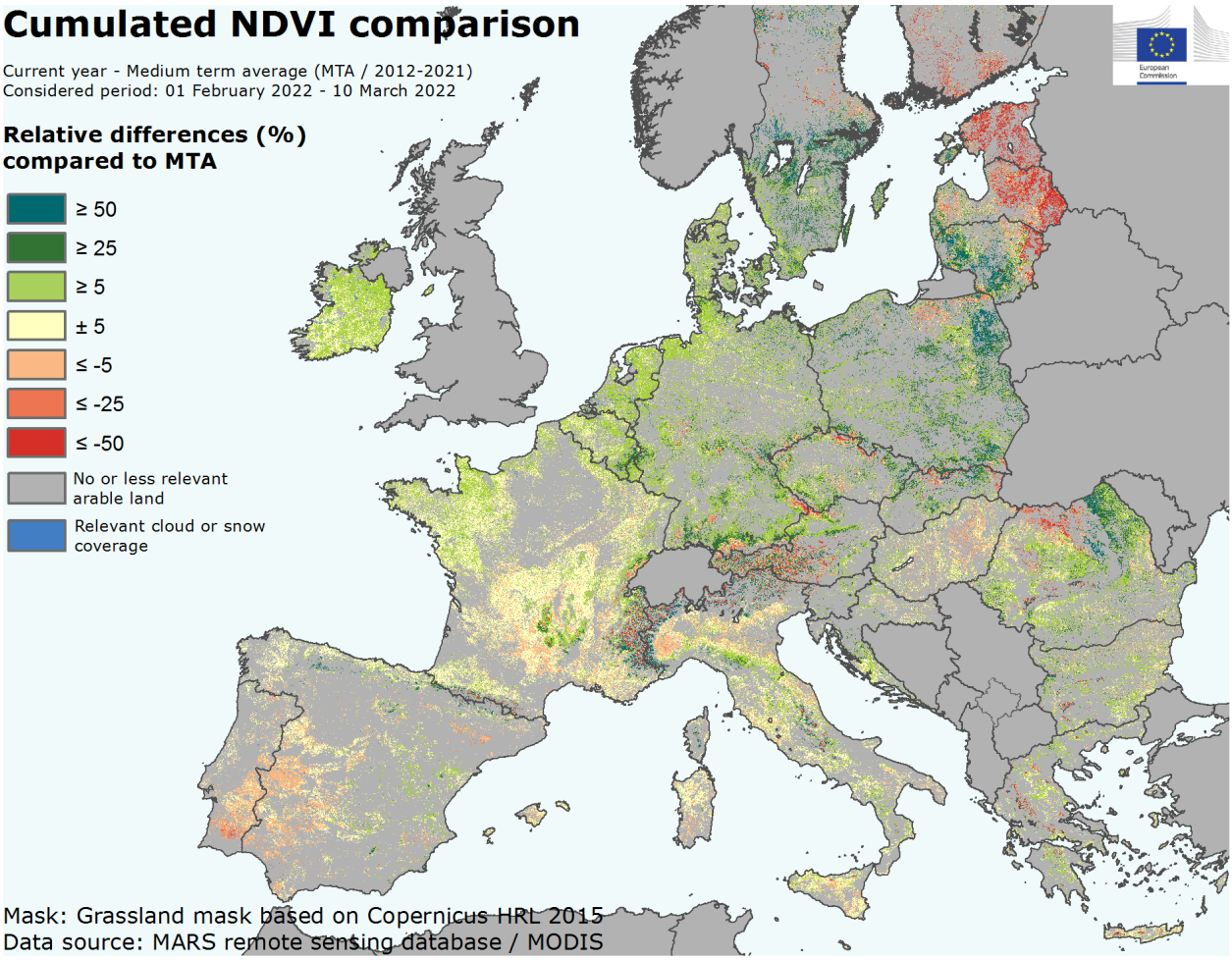
2. Pastures in Europe – regional monitoring

Mild - but in many regions dry - start to the season

The map below displays the differences between the Normalized Difference Vegetation Index (NDVI) cumulated from 1 February to 10 March 2022, and the medium-term average (MTA, 2012-2021) for the same period. Positive anomalies (in green) reflect above-average canopy density or early regrowth, while negative anomalies (in red) reflect below-average biomass accumulation or delayed regrowth.

In large parts of Europe, mild winter weather conditions have been favourable for pastures, as reflected by the greenish colours on the map. Many of the areas marked by very dark-green colours are areas that in average years would still be covered by snow during most of the observation period. Below-average photosynthetic activity and biomass accumulation can be inferred from the red-coloured areas in large parts of the Iberian Peninsula, north-western Italy, and eastern Hungary. This is mostly attributed to lack of rain during the observation period.

The dark-red coloured areas in mountainous regions and the Baltic countries are attributed to continued cold and/or snowy conditions during the period of interest.



3. Country headlines

3.1. European Union

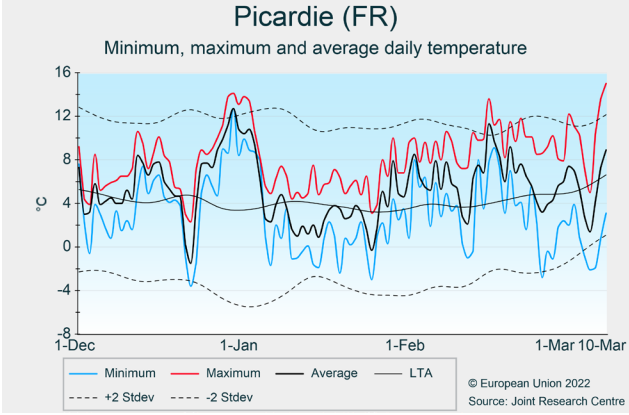
France

Good conditions so far

Winter was drier than usual, with the most substantial negative precipitation anomalies in the western and southern parts of the country. Warmer-than-usual conditions prevailed overall, with an average positive thermal anomaly of 1 °C during the review period. An exceptionally warm 10-day event occurred around new year, and temperatures in February were on average 2 °C above the LTA. No frost damage was recorded.

The relatively dry conditions did not cause any damage to winter crops during the dormancy stage. Winter wheat and barley, which are initiating stem elongation stage in line with previous years, are in particularly good condition. Rapeseed is also in good condition, and benefited from the relatively dry winter. Durum wheat, cultivated in the south of the country, is slightly behind due to the dry conditions.

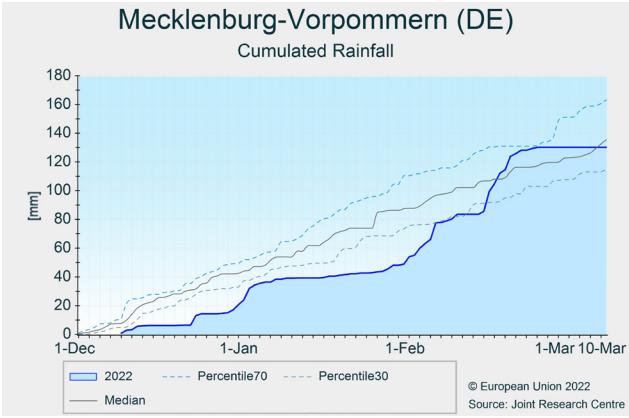
According to the Céré'Obs report published by FranceAgriMer[1], around 76% of the spring cereals have been sown so far, which is in line with other years. The current crop yield forecasts are based on historical trends.



Germany

Mild winter and sufficient precipitation

Winter was characterised by warmer-than-usual temperatures throughout the country with up to 20 more frost-free days compared to an average year. Thus frost tolerance is rather weak, making crops susceptible to freezing temperatures as seen in the beginning of March. However, in the absence of extreme frost winter crops are considered in good shape. The continued above-average winter temperatures favour the survival of pest insects, which could lead to increased pressure later in the season. While December on average was a dry month, January brought precipitation mainly in central Germany. In February, rainfall was abundant with monthly totals beyond 100 mm in the north and north-west, while in the south only average precipitation was recorded. Since 1 March rain has been absent again, and while somewhat drier areas emerge in the south, soil water reservoirs are well replenished at the start of the growing season elsewhere. Preparation for spring sowings are now under way.



[1] https://cereobs.franceagrimer.fr

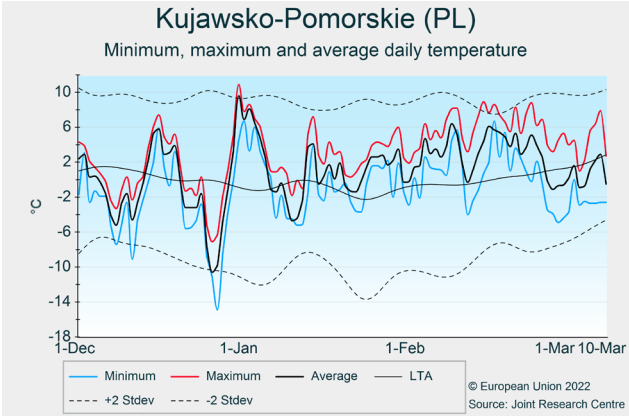
Poland

Winter without serious frost damages

December was characterised by the below-average temperatures throughout the country. A cold spell during the last dekad of December resulted locally in minimum temperatures below -15 °C. On the contrary, January and especially February were substantially warmer than usual with temperatures exceeding the long-term average (LTA) by 2 °C to 4 °C. Frequent precipitation during the period of review resulted in average or above-average precipitation totals and generated adequate soil water reserves for the start of the growing season. Locally, topsoils were even overly wet impairing early field operations.

The condition of winter crops is generally good. December's cold spell did not cause serious frost damage to winter crops that were well hardened and adequately protected by snow cover. The warmer-than-usual February triggered an early regrowth of winter crops and rendered plants susceptible to frost hazard. Additionally, the mild and wet conditions in February favour an increased pressure of fungal diseases.

The early season yield outlook is overall positive and in line with the historical trends.

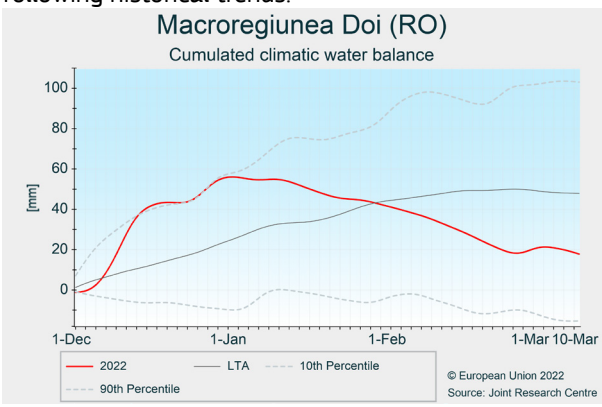


Romania

Rainfall is urgently needed

The cold and wet start of the season in October hampered the sowings of winter crops. This resulted in a delay in crop development before entering the winter. Since then, above-average temperatures have prevailed in most of the country, most distinctly in the southern and eastern parts with temperatures up to 4 °C above average from December 2021 until February 2022. Consequently, winter crops were not exposed to any severe frost kill event. They are expected to have partially compensated their delayed development and resumed their vegetative growth. From early March, a significant drop in temperature was registered.

However, Romania has experienced drier-than-usual conditions since the beginning of the year, especially in the eastern half of the country where rainfall was locally up to 80% below the LTA. Hence, rainfall is needed to maintain the yield potential we are currently forecasting following historical trends.



Spain and Portugal

A dry start to the year

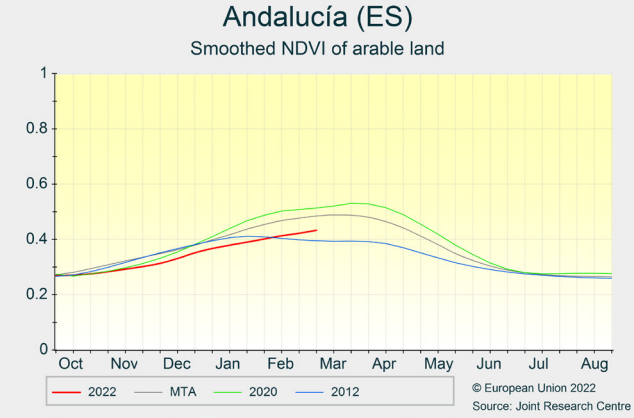
Cumulated rainfall since December has been below 50% of LTA throughout the Peninsula, with the lowest values (30-35% of LTA) in Alentejo and Extremadura. Average temperatures (most distinctly of daily maxima) and radiation sums are above the LTA.

Reservoirs in southern parts of the Iberian Peninsula have started the year at a very low level. For example, Murcia is at 22% of capacity; Andalucia 31%, Castilla la Mancha 37%, Extremadura 38% (www.embalses.net, 15 March 2022). In Portugal, water levels in most reservoirs are above 50% of capacity, but with large variations; e.g. 4% in Campilhas; 100% in Serra Serrada (sir.dgadr.gov.pt/reservas).

Remote sensing indicators suggest that winter cereals are lagging behind in growth and development; most distinctly in southern regions, such as Andalucia, Extremadura, Alentejo. Recent rain in the southern half of the Peninsula partly replenished soil moisture, and more rain is expected; but substantial rainfall in the coming weeks will be needed for growth to recover. In northern parts of Spain (e.g. Castilla y Léon), high yields may still be possible.

The dry conditions and low water reserves for irrigation may also have an impact on spring sowings in the southern provinces of Spain, where maize and rice may be partly replaced by sunflowers. The current geo-political situation and associated high costs of fuels and fertilisers also contribute to uncertainty regarding farmers' decisions.

Our current yield forecasts are mostly below the 5-year average and partially based on historical trends.



Hungary

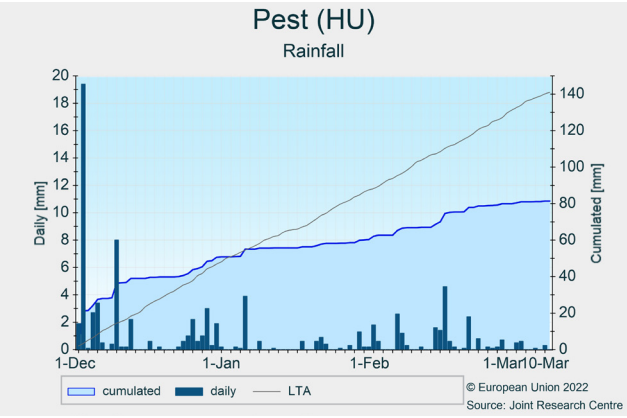
Dry and warm winter

While December was wetter-than-usual in the west, south, and east of Hungary, only average precipitation was recorded in the centre of the country. Since January, the rain deficit has been developing in all growing regions with around or less than 50% of seasonal precipitation observed. January was very dry, especially in the centre and the north of the country, and some limited precipitation amounts in February have not replenished soil moisture to a sufficient level. The first dekad of March has remained dry so far again. Altogether, the moisture deficit is worrisome from the centre to the east of the country, while in western Hungary – as well as along the southern and eastern border – the deficit remains limited thanks to the abundant precipitation received in early winter.

Temperatures were 1.25 °C above the LTA on average for the whole review period. Mild days around the end of year were followed by a colder-than-average second dekad of January, while the entire February was warmer than usual.

No frost kill was simulated by our model.

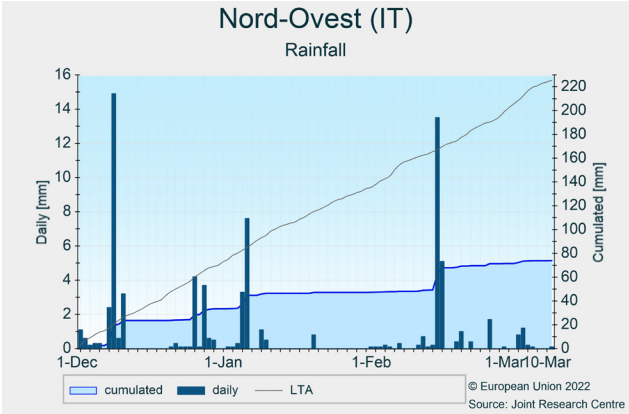
The winter crop conditions are close to normal level only in the west. In the centre and north-east, the vegetation already depicts the dry conditions; catching-up on the vegetation growth deficit will depend on rainfall in March and April. The spring cereals sowing campaign has started in the west and might be delayed in the east. The current crop yield forecasts are based on historical trends.



Italy

Drought and cold for a difficult start of the season

In north-western Italian regions crops are facing drought conditions with precipitation sums 80% below the LTA. North-eastern regions are only slightly less dry 50 to 80% below LTA. Rain is urgently needed to avoid reducing yield potential, to favour fertiliser application, and to allow for good maize sowing conditions. The low snowpack on the Alps is of paramount concern and will affect the replenishment of rivers and lakes. These are already far below their average capacity, the Po is at its lowest level for 30 years[2]. In central and southern regions winter was drier than usual along western regions (e.g. Sicilia) but average in the other main durum wheat growing regions (e.g. Puglia and Marche). In all these regions, the sharp cooling of temperatures since 20 February has resulted in suboptimal conditions for cereal growth, already delayed due to late sowings. However winter crops can still produce around-average yields if conditions improve in the coming weeks. Crop yield forecasts are still based on historical trends.

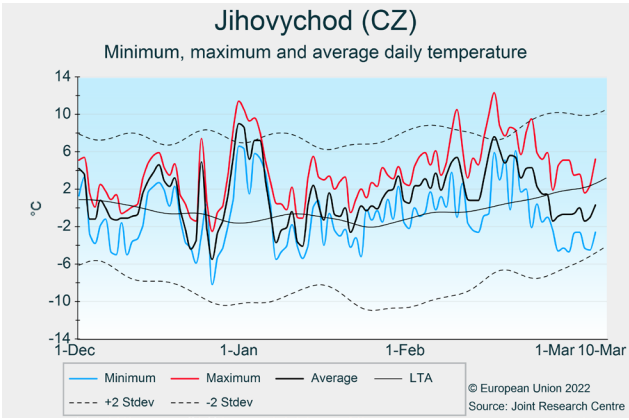


Czechia, Austria and Slovakia

Crops in fair conditions after mild winter

Overall, the reporting period was relatively mild, with lowest temperatures below -8 °C occurring only once during a cold spell at the end of December that was otherwise characterised by around-normal temperatures. January started warm with temperatures reaching up to 10 °C and subsequently fluctuating around the LTA during the second dekad of the month. The last dekad of January and most of February were warmer than average, followed by temperatures below average at the end of the review period.

Precipitation since the beginning of winter has been around the LTA, with the exception of south-eastern Czechia, north-eastern Austria and western Slovakia, where a mild precipitation deficit was observed. Nevertheless, soil moisture reserves are generally satisfactory at the beginning of the growing season. The yield outlook for winter crops is currently in line with the long-term trend.

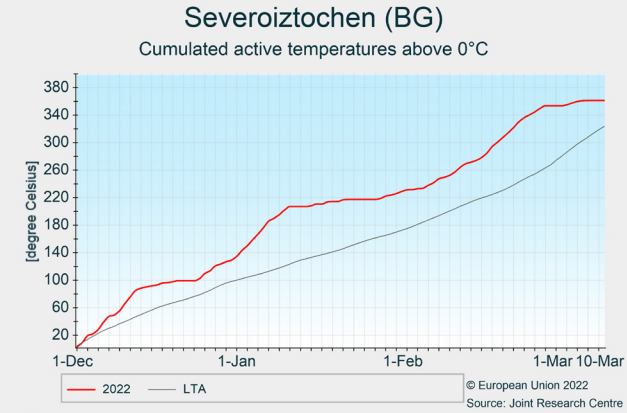


[2] www.adbpo.it - Basin authority for the Po river.

Bulgaria

Adequate conditions for winter crops

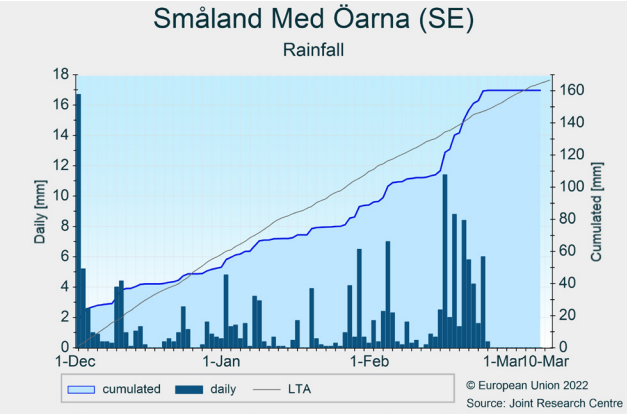
From the beginning of December, Bulgaria experienced mild weather with average air temperatures above the LTA (+2 °C). In the north-westernmost areas (*Severozapaden*), increases of between 2 °C to 4 °C above the LTA were registered locally. Crops ended their dormancy at the end of February following the relatively high temperature sum (T_{base} = 0 °C). Precipitation cumulates were close to seasonal average in northern regions, and well above the LTA (up to +30%) in southern and coastal regions. Rainfall was uniformly distributed during the review period, even if particularly abundant in December and since the end of February, replenishing soil moisture content. Overall, winter crops are in good shape but despite the high temperatures still delayed in phenological development due to late sowings, because of wet weather and suboptimal soil conditions that hampered field work in October. The current crop yield forecasts are based on historical trends.



Denmark and Sweden

Winter crops benefit from mild winter conditions

Winter conditions were warmer than usual, except for a significant cold spell that was registered during the last dekad of December. After a wet beginning of winter, the period was characterised by less precipitation than usual until mid-February, after which values increased above the LTA due to the abundant rainfall observed in both countries. Radiation remained close to the LTA. Winter crops benefitted from the mild winter weather, which favoured an early regrowth. Agricultural practices carried out during early spring are in full swing, fields are being fertilised, and spring barley sowing started at the beginning of March. Thanks to the sunny weather conditions since the beginning of March, spring crops sowing is going to start also in the fields where heavy rainfall had created unfavourable wet conditions for field work at the end of February. The overall outlook for winter crops is positive. The current crop yield forecasts are based on historical trends.



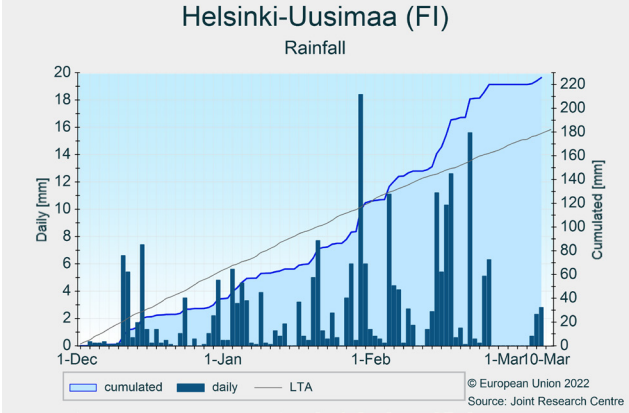
Estonia, Latvia, Lithuania, Finland

Winter crops generally in good conditions

Mild temperatures prevailed during the review period. Nonetheless, cold anomalies were registered during the first and last dekad of December, the first half of January, and for a few days at the beginning of February. Precipitation was close to the LTA in most parts of the Baltic countries until January but exceeded the average from February. In Finland, precipitation was generally scarce until mid-February, after which it increased above the LTA. Radiation levels remained close to the LTA.

Crops passed the winter period in good conditions, with limited disease pressure. However, some fields were flooded after the heavy rainfall of February, although this did not affect field work. Remote sensing information suggests that post-winter regrowth has not started.

Favourable sowing conditions and high prices led to an increased area of winter rapeseed this year. Current yield forecasts are based on historical trends and averages.



Greece and Cyprus

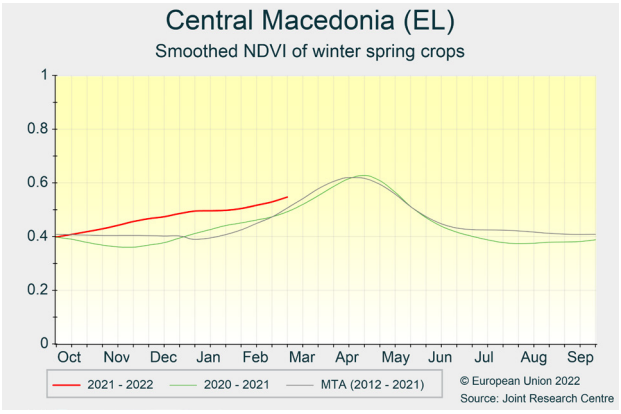
Good crop conditions, concerns about rising production costs

In Greece, the sowing of winter cereals started around the beginning of November and progressed well throughout the sowing campaign.

In January, slightly colder-than-usual conditions slowed down the growth of crops, allowing for excellent conditions for winter dormancy. Also, our crop model simulations do not alert for any frost damage to winter cereals in this period.

Precipitation cumulates from December to the first dekad of March are close to the average in most of Greece and Cyprus.

Remote sensing profiles suggest above-average biomass formation. This indicates that winter crops have developed well and are in fair to good conditions. Nevertheless, rising costs of fertilisers and fuel might reduce the usual efficacy of crop management and combined with the risk of late cold spells a reduction in biomass production is not excluded. Our March forecasts are close to the last 5-year averages in both countries and are mainly based on historical trends.

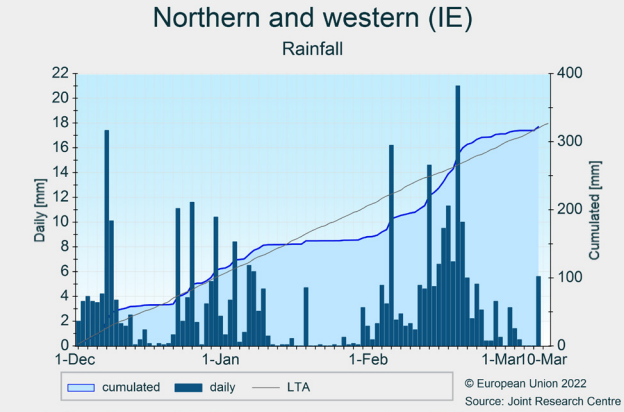


Ireland

Winter crops in fair condition after mild winter

Thermal conditions during winter were warmer than usual. Radiation levels remained close to the LTA. Overall precipitation levels were below or close to average. Heavy rainfall during mid-February resulted in deteriorated terrain conditions for field operations such as the application of fertilisers and pesticides. Spring sowing only made a weak start, but is expected to accelerate in the coming weeks if current favourable conditions continue. An increase of pest and disease pressure related to the mild weather condition was reported. However, the overall outlook for winter crops is positive, with an advanced crop development.

The forecasts for all crops are based on the historical trend.



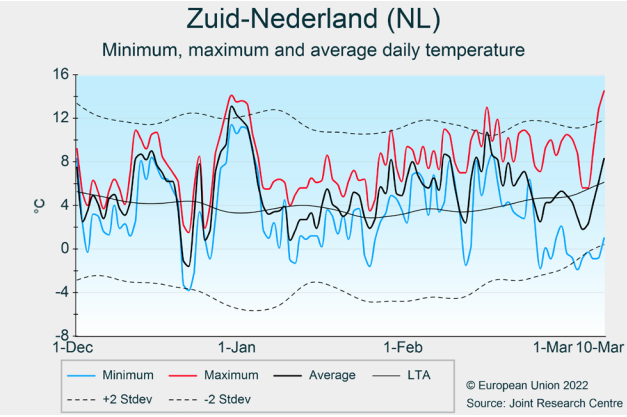
Belgium, Luxembourg and the Netherlands

Favourable start to spring

Temperatures were above the LTA during most of the review period. Temperature fluctuations were relatively small, with the exception of a brief colder-than-usual period at the end of December, followed by a few days of distinctly warmer-than-usual conditions. Frost events were much scarcer than usual, and minimum temperatures during the coldest days remained above -5 °C in most regions. Rainfall was close to average, with frequent and abundant rainfall in February, while January, and March so far were mostly dry.

Winter crops benefited from the mild temperatures, and the sunny and dry conditions in March created favourable soil and terrain conditions for farmers to enter their fields for the application of fertilisers and spring sowings. The area sown to spring wheat and spring barley is expected to be higher than originally planned due to the recent steep increase of cereal prices.

The current crop yield forecasts are based on historical trends.



Slovenia and Croatia

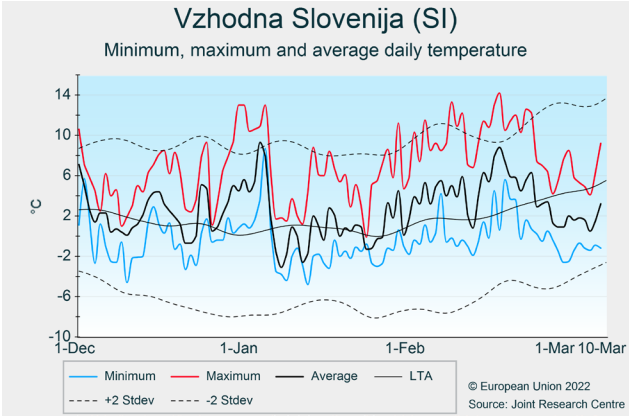
Mild winter with substantial rain deficit

Temperatures during the period of analysis were slightly above the seasonal average. The number of very cold days (< -8 °C) was significantly lower than usual, and there was no tangible frost kill.

Average winter temperatures in December and January were interrupted by a mild period around the end of the year reaching daily averages above 10 °C. February was predominantly 2-4 °C warmer than seasonal values, while in the beginning of March temperatures dropped to below-average conditions.

A considerable precipitation deficit was observed in Slovenia and Croatia during the review period, with rainfall totals around 50% below the LTA in Slovenia and 30-50% below the LTA in most parts of Croatia. January and February in particular remained dry, except for a single rainfall event on around 5 January. Due to the lack of rainfall soil moisture was not replenished, which might have become a limiting factor for the spring re-growth of winter crops.

The current yield outlook is nonetheless based on trends, but if dry conditions prevail during the coming weeks, negative impacts on crops are likely.

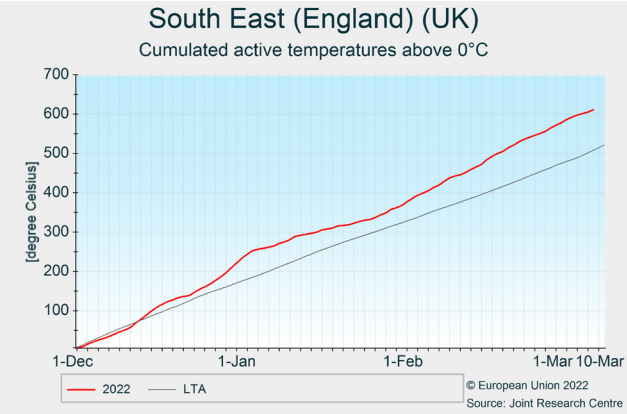


3.2 United Kingdom

Winter crops in fair condition after mild and dry winter

The period was characterised by above-average temperatures, with the highest deviations from the LTA occurring at the end of December in many agricultural areas of the country (around 8 °C above the LTA). Rainfall was below the LTA, and the month of January was one of the driest on our records (since 1979).

Crops look generally well. The dry winter helped to limit nitrogen losses. The mild weather favoured disease development during winter, although the generally dry conditions should allow farmers to apply plant health measures. Mild weather also permitted the first fertiliser applications, and an early start of spring drilling in mid-February on the lighter soils. The overall outlook for winter crops is positive.



3.3 Black Sea Area

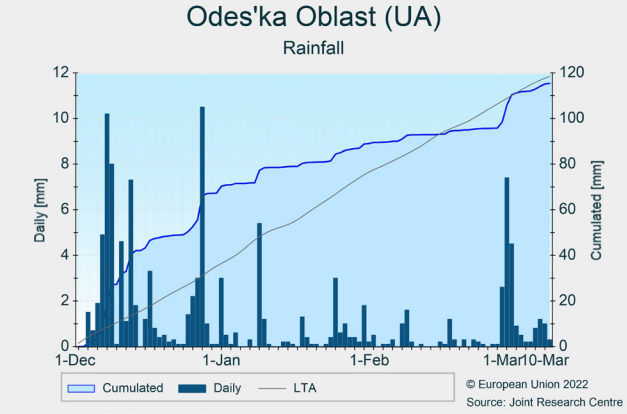
Ukraine

Favourable winter weather maintains crop yield potentials

After a colder-than-usual start to the autumn in most of the country, above-average temperatures prevailed in Ukraine from early November until the end of February, with monthly averages of 2 to 4 °C above the LTA in the major winter crop growing regions. Temperatures were back to seasonal levels in early March. Due to the absence of extreme frost, there has been no or very low risk of frost-kill damage for winter crops.

The dry autumn was followed by abundant rainfall in December across the country. Drier-than-usual conditions prevailed in January and February in the southern and central parts, most distinctly in the oblasts of Odessa and Mykolayiv, whereas the rest of Ukraine experienced seasonal rainfall. Above-average rainfall was registered in the main growing regions in the first dekad of March, which allows maintaining the yield potential of winter crops.

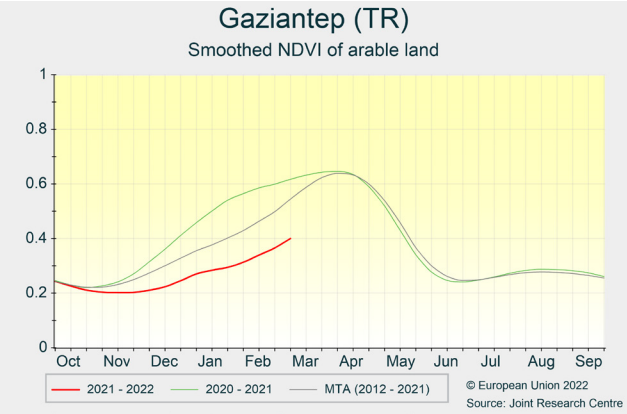
At this point, our yield forecasts are based on trends and assume regular field operations such as nitrogen fertilisation and disease control, which as a matter of fact remain uncertain due to the Russian invasion on Ukraine's territory.



Turkey

Cold winter and late sowings delayed crop growth

In central Turkey, winter was generally wetter and colder than usual, notably so in western Anatolian regions that account for a large share of the national crop production. In Konya, the most important agricultural region, temperatures dropped to -18 °C at the beginning of February but with limited frost impact on crops. The average to abundant precipitation restored soil water to full capacity after the drought of last year, providing a favourable perspective for the ongoing winter crops season. In south-eastern regions, winter crops are late and still in early vegetative phase due to the late December sowings just after the end of the drought. Such delays, at the moment around 30 days (e.g. Gaziantep), increases the risk of heat stress later in the season. However, actual crop conditions are fine and favoured by average precipitation. Forecasts as based on historical trends.



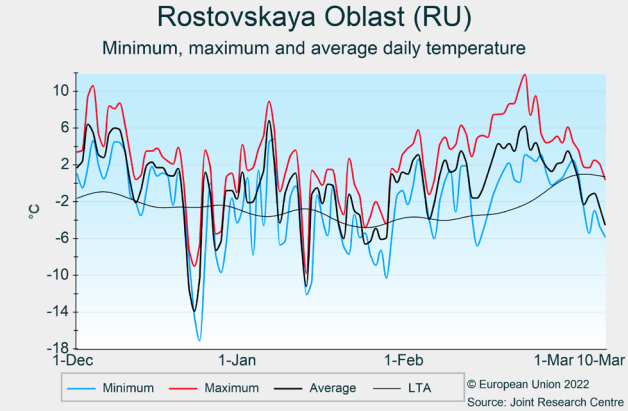
3.4 European Russia and Belarus

European Russia

Yield potential maintained thanks to the mild and wet winter conditions

Warmer than usual temperatures prevailed in most of European Russia from November until February. On average, daily mean temperatures during winter were 2 to 4 °C above average in southern and eastern Russia and still warmer than usual elsewhere. Two minor cold spells occurred in late December and around mid-January, without causing any significant frost kill damage to winter crops. February was particularly warm with temperatures 4 to 6 °C higher than the LTA in most of the territory. In the first dekad of March, temperatures were back to seasonal levels.

The winter was overall wet throughout European Russia, especially in the Southern okrug, the eastern Central okrug, and in the south of the Volga okrug. Only in the southern North Caucasian okrug and in the northern Volga okrug was precipitation below average until February. In the first dekad of March, abundant rainfall prevailed all over the main growing regions of winter cereals. Consequently, most agricultural areas in European Russia benefit from a fair soil moisture supply, and winter crops are expected to have resumed their vegetative growth under good conditions in early March.

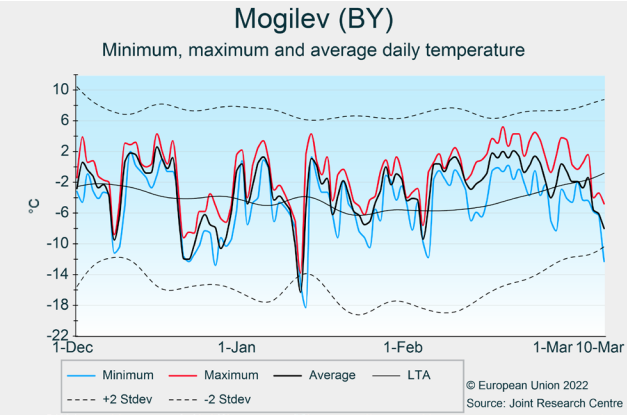


Belarus

Fair weather conditions for winter cereals

Colder than usual conditions prevailed in early and late December when cold spells resulted in temperature drops to below -18 °C, while the second dekad of the month was warmer than average. January, and especially, February were characterised by above-average temperatures, interrupted by brief cold spells on 11-13 January and 4 February when minimum temperatures dropped locally below -20 °C. Frequent and evenly distributed precipitation resulted in average totals for the entire period of analysis meaning that moisture reserves are adequate for the start of the growing season in the whole country.

Due to generally fair conditions, winter wheat did not suffer seriously from frost kill, and the early season yield outlook is in line with the historical trends.



3.5 Maghreb

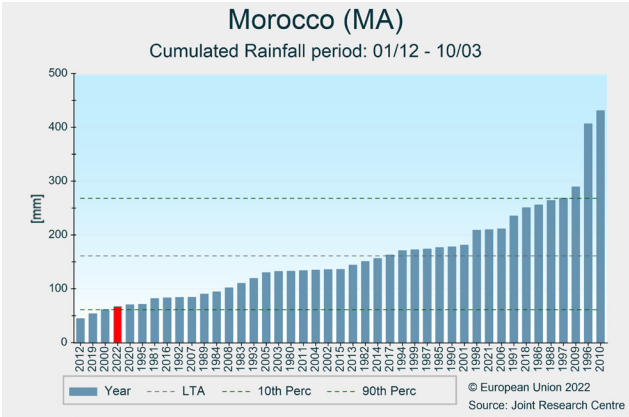
Morocco, Algeria and Tunisia

Yield outlook revised downward due to persisting drought conditions

Morocco is currently experiencing alarming drought conditions, which appear to have already compromised the current cereals campaign. A significant lack of precipitation has been observed in all the cereal producing regions of the country since the beginning of December. Cumulated rainfall for the reporting period is 70 to 100% less than the LTA values (70 to 150 mm). Remote sensing indicators confirm crop failure conditions in the regions of *Casablanca-Settat*, *Marrakech-Safi*, *Béni Mellal-Khénifra*, *Souss-Massa*, and *Oriental.*

Even in **Algeria**, seasonal drought conditions markedly hampered crop biomass accumulation during the cereals' vegetative and flowering periods. Current biomass accumulation levels, in most of the main western (e.g. *Tiaret*, *Tlemcen* and *Sidi Bel Abbes*) and eastern (e.g. *Oum El Bouaghi*, *Constantine* and *Guelma*) agricultural areas are well below the long-term average and below the previous (unfavourable) cereal campaign.

Winter crop conditions in **Tunisia** degraded in comparison with the outlook of February. Cereals in this country are least affected by the seasonal drought of the Maghreb area. However, the precipitation deficit occurred in February and March led to below-average biomass accumulations in most of the regions, with the only exceptions being *Zaghouan*, *Manouba* and *Nabeul*. Yield forecasts have been revised from below to well below the historical trends for most of the Maghreb countries.



4. Crop yield forecast

Country	Total wheat (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	5.61	5.81	**5.80**	+ 3.2	– 0.2
AT	5.34	5.50	**5.69**	+ 6.7	+ 3.5
BE	8.61	7.80	**8.73**	+ 1.4	+ 12
BG	5.04	5.96	**5.38**	+ 6.8	– 10
CY	—	—	**—**	—	—
CZ	5.84	6.33	**6.28**	+ 7.5	– 0.7
DE	7.36	7.30	**7.69**	+ 4.5	+ 5.4
DK	7.77	7.62	**8.05**	+ 3.6	+ 5.6
EE	4.27	4.09	**4.62**	+ 8.2	+ 13
EL	2.73	2.73	**2.71**	– 0.7	– 0.6
ES	3.45	3.93	**3.53**	+ 2.3	– 10
FI	3.62	3.19	**3.84**	+ 6.1	+ 20
FR	7.15	6.99	**7.07**	– 1.2	+ 1.1
HR	5.84	6.63	**5.92**	+ 1.4	– 11
HU	5.44	5.97	**5.69**	+ 4.6	– 4.7
IE	9.65	10.6	**10.0**	+ 3.7	– 5.2
IT	3.90	4.12	**3.92**	+ 0.5	– 5.0
LT	4.55	4.50	**5.01**	+ 10	+ 11
LU	5.89	5.96	**6.04**	+ 2.7	+ 1.4
LV	4.60	4.48	**4.85**	+ 5.3	+ 8.1
MT	—	—	**—**	—	—
NL	8.86	8.20	**8.98**	+ 1.3	+ 9.5
PL	4.74	5.07	**5.08**	+ 7.0	+ 0.1
PT	2.48	2.65	**2.39**	– 3.3	– 9.6
RO	4.52	5.30	**4.81**	+ 6.4	– 9.3
SE	6.53	6.31	**6.79**	+ 4.0	+ 7.6
SI	5.23	5.77	**5.53**	+ 5.6	– 4.1
SK	5.08	5.63	**5.07**	– 0.3	– 10

Country	Soft wheat (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	5.84	6.04	**6.02**	+ 3.1	– 0.3
AT	5.40	5.57	**5.78**	+ 6.9	+ 3.7
BE	8.61	7.80	**8.73**	+ 1.4	+ 12
BG	5.04	5.96	**5.38**	+ 6.8	– 10
CY	—	—	**—**	—	—
CZ	5.84	6.33	**6.28**	+ 7.5	– 0.7
DE	7.39	7.32	**7.73**	+ 4.6	+ 5.5
DK	7.77	7.62	**8.05**	+ 3.6	+ 5.6
EE	4.27	4.09	**4.62**	+ 8.2	+ 13
EL	2.90	3.02	**2.87**	– 1.2	– 5.3
ES	3.56	4.17	**3.67**	+ 3.1	– 12
FI	3.62	3.19	**3.84**	+ 6.1	+ 20
FR	7.25	7.09	**7.15**	– 1.5	+ 0.8
HR	5.84	6.63	**5.92**	+ 1.4	– 11
HU	5.47	5.99	**5.72**	+ 4.6	– 4.5
IE	9.65	10.6	**10.0**	+ 3.7	– 5.2
IT	5.49	6.33	**5.49**	+ 0.0	– 13
LT	4.55	4.50	**5.01**	+ 10	+ 11
LU	5.89	5.96	**6.04**	+ 2.7	+ 1.4
LV	4.60	4.48	**4.85**	+ 5.3	+ 8.1
MT	—	—	**—**	—	—
NL	8.86	8.20	**8.98**	+ 1.3	+ 9.5
PL	4.74	5.07	**5.08**	+ 7.0	+ 0.1
PT	2.48	2.65	**2.39**	– 3.3	– 9.6
RO	4.52	5.30	**4.81**	+ 6.4	– 9.3
SE	6.53	6.31	**6.79**	+ 4.0	+ 7.6
SI	5.23	5.77	**5.53**	+ 5.6	– 4.1
SK	5.11	5.59	**5.08**	– 0.6	– 9.1

Country	Durum wheat (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	3.52	3.54	**3.60**	+ 2.2	+ 1.5
AT	4.42	4.51	**4.57**	+ 3.5	+ 1.4
BE	—	—	**—**	—	—
BG	—	—	**—**	—	—
CY	—	—	**—**	—	—
CZ	—	—	**—**	—	—
DE	5.24	5.52	**5.23**	– 0.2	– 5.2
DK	—	—	**—**	—	—
EE	—	—	**—**	—	—
EL	2.67	2.60	**2.65**	– 0.6	+ 1.7
ES	2.85	2.49	**2.65**	– 6.9	+ 6.3
FI	—	—	**—**	—	—
FR	5.52	5.41	**5.75**	+ 4.2	+ 6.3
HR	—	—	**—**	—	—
HU	4.74	5.42	**4.89**	+ 3.2	– 10
IE	—	—	**—**	—	—
IT	3.25	3.31	**3.33**	+ 2.5	+ 0.8
LT	—	—	**—**	—	—
LU	—	—	**—**	—	—
LV	—	—	**—**	—	—
MT	—	—	**—**	—	—
NL	—	—	**—**	—	—
PL	—	—	**—**	—	—
PT	—	—	**—**	—	—
RO	—	—	**—**	—	—
SE	—	—	**—**	—	—
SI	—	—	**—**	—	—
SK	4.91	5.91	**5.03**	+ 2.4	– 15

Country	Winter barley (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	5.75	6.08	**5.83**	+ 1.5	– 4.1
AT	6.52	6.53	**6.78**	+ 4.0	+ 3.8
BE	8.15	7.79	**8.40**	+ 3.0	+ 7.8
BG	4.69	5.38	**5.00**	+ 6.6	– 7.0
CY	1.79	1.83	**1.75**	– 1.9	– 4.3
CZ	5.76	5.87	**5.82**	+ 1.0	– 0.9
DE	6.91	7.16	**7.05**	+ 2.0	– 1.6
DK	6.60	6.64	**6.80**	+ 3.1	+ 2.5
EE	5.02	5.11	**4.95**	– 1.4	– 3.1
EL	2.67	2.47	**2.64**	– 1.0	+ 6.8
ES	2.69	2.98	**2.63**	– 2.2	– 12
FI	—	—	**—**	—	—
FR	6.47	6.85	**6.48**	+ 0.1	– 5.4
HR	5.01	5.49	**5.15**	+ 2.7	– 6.2
HU	5.72	6.58	**6.03**	+ 5.5	– 8.3
IE	9.07	9.42	**9.41**	+ 3.7	– 0.1
IT	4.09	4.21	**4.12**	+ 0.7	– 2.1
LT	4.15	4.17	**4.16**	+ 0.1	– 0.2
LU	—	—	**—**	—	—
LV	4.86	4.95	**4.98**	+ 2.5	+ 0.8
MT	—	—	**—**	—	—
NL	—	—	**—**	—	—
PL	4.58	4.77	**4.65**	+ 1.6	– 2.5
PT	2.96	3.35	**2.76**	– 6.8	– 17
RO	4.50	5.54	**4.74**	+ 5.4	– 15
SE	5.94	5.58	**6.55**	+ 10	+ 17
SI	4.97	5.45	**5.29**	+ 6.4	– 2.9
SK	5.30	5.72	**5.35**	+ 1.1	– 6.4

Country	Rye (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	3.90	4.17	**4.19**	+ 7.6	+ 0.6
AT	4.52	4.61	**4.63**	+ 2.5	+ 0.4
BE	—	—	**—**	—	—
BG	—	—	**—**	—	—
CY	—	—	**—**	—	—
CZ	5.07	5.03	**5.10**	+ 0.6	+ 1.3
DE	5.10	5.27	**5.34**	+ 4.7	+ 1.4
DK	6.08	6.34	**6.27**	+ 3.0	– 1.2
EE	3.77	3.61	**3.80**	+ 0.7	+ 5.1
EL	—	—	**—**	—	—
ES	2.31	2.56	**2.06**	– 11	– 20
FI	3.93	3.67	**3.84**	– 2.5	+ 4.5
FR	4.42	4.26	**4.57**	+ 3.2	+ 7.2
HR	—	—	**—**	—	—
HU	3.31	3.18	**3.44**	+ 4.0	+ 8.0
IE	—	—	**—**	—	—
IT	—	—	**—**	—	—
LT	2.57	2.43	**2.48**	– 3.5	+ 2.1
LU	—	—	**—**	—	—
LV	4.13	3.84	**4.22**	+ 2.0	+ 9.7
MT	—	—	**—**	—	—
NL	—	—	**—**	—	—
PL	2.99	3.31	**3.31**	+ 11	+ 0.1
PT	1.07	1.14	**1.13**	+ 4.7	– 1.6
RO	2.88	3.37	**2.98**	+ 3.6	– 12
SE	6.06	5.66	**6.57**	+ 8.5	+ 16
SI	—	—	**—**	—	—
SK	3.50	3.55	**3.71**	+ 6.0	+ 4.7

Country	Triticale (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	4.19	4.42	**4.37**	+ 4.2	– 1.1
AT	5.36	5.29	**5.47**	+ 2.1	+ 3.5
BE	—	—	**—**	—	—
BG	3.13	3.83	**3.35**	+ 7.1	– 13
CY	—	—	**—**	—	—
CZ	4.84	4.74	**4.95**	+ 2.2	+ 4.2
DE	5.86	5.81	**6.25**	+ 6.6	+ 7.5
DK	—	—	**—**	—	—
EE	—	—	**—**	—	—
EL	2.37	2.46	**2.33**	– 1.3	– 5.0
ES	2.64	2.94	**2.65**	+ 0.3	– 10
FI	—	—	**—**	—	—
FR	5.09	5.20	**5.16**	+ 1.3	– 0.7
HR	—	—	**—**	—	—
HU	4.02	4.36	**4.33**	+ 7.7	– 0.7
IE	—	—	**—**	—	—
IT	—	—	**—**	—	—
LT	3.25	2.77	**3.23**	– 0.5	+ 17
LU	—	—	**—**	—	—
LV	—	—	**—**	—	—
MT	—	—	**—**	—	—
NL	—	—	**—**	—	—
PL	3.87	4.25	**4.08**	+ 5.6	– 4.0
PT	1.60	1.54	**1.59**	– 0.8	+ 3.1
RO	4.03	4.55	**4.22**	+ 4.8	– 7.2
SE	5.57	5.14	**5.85**	+ 5.1	+ 14
SI	—	—	**—**	—	—
SK	—	—	**—**	—	—

Country	Rape and turnip rape (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
EU	3.07	3.20	**3.22**	+ 4.6	+ 0.6
AT	3.00	3.04	**3.11**	+ 3.6	+ 2.2
BE	—	—	**—**	—	—
BG	2.72	2.82	**2.84**	+ 4.6	+ 0.6
CY	—	—	**—**	—	—
CZ	3.16	3.00	**3.23**	+ 2.3	+ 7.7
DE	3.33	3.50	**3.65**	+ 10	+ 4.3
DK	4.00	4.01	**4.08**	+ 2.1	+ 1.7
EE	2.42	2.81	**2.46**	+ 1.6	– 12
EL	—	—	**—**	—	—
ES	2.22	2.61	**2.20**	– 1.2	– 16
FI	1.39	1.20	**1.42**	+ 2.3	+ 18
FR	3.28	3.34	**3.30**	+ 0.5	– 1.3
HR	2.76	2.43	**2.97**	+ 7.8	+ 22
HU	2.95	2.73	**3.24**	+ 9.9	+ 19
IE	4.22	4.58	**4.36**	+ 3.2	– 4.9
IT	2.80	3.05	**3.10**	+ 11	+ 1.5
LT	2.97	3.20	**2.94**	– 1.1	– 8.3
LU	—	—	**—**	—	—
LV	2.68	2.53	**2.95**	+ 9.9	+ 17
MT	—	—	**—**	—	—
NL	—	—	**—**	—	—
PL	2.95	3.21	**3.11**	+ 5.5	– 3.1
PT	—	—	**—**	—	—
RO	2.60	3.02	**2.78**	+ 7.0	– 7.9
SE	3.18	3.23	**3.49**	+ 10	+ 7.9
SI	—	—	**—**	—	—
SK	3.00	3.06	**3.16**	+ 5.3	+ 3.3

Country	Wheat (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
BY	3.45	3.54	**3.72**	+ 7.8	+ 5.1
DZ	1.65	N/A	**0.88**	– 47	N/A
MA	1.82	N/A	**0.95**	– 48	N/A
TN	1.82	N/A	**1.70**	– 6.9	N/A
TR	2.79	2.66	**2.94**	+ 5.2	+ 10
UA	4.10	4.64	**4.39**	+ 7.2	– 5.3
UK	8.03	7.80	**8.07**	+ 0.5	+ 3.5

Country	Barley (t/ha)				
	Avg 5yrs	2021	MARS 2022 forecasts	%22/5yrs	%22/21
BY	2.85	2.86	**3.29**	+ 16	+ 15
DZ	1.24	N/A	**0.91**	– 27	N/A
MA	1.17	N/A	**0.58**	– 50	N/A
TN	0.96	N/A	**0.78**	– 18	N/A
TR	2.53	1.87	**2.60**	+ 2.8	+ 39
UA	3.37	3.92	**3.45**	+ 2.4	– 12
UK	6.15	6.09	**6.35**	+ 3.3	+ 4.3

NB: Yields are forecast for crops with more than 10 000 ha per country with sufficently long and coherent yield time series.

Sources: 2017-2022 data come from DG Agriculture and Rural Development short-term-outlook data (dated February 2022, received on 04.03.2022), Eurostat Eurobase (last update: 01.03.2022) and EES (last update: 15.11.2017).

Non-EU 2017-2021 data come from USDA, Turkish Statistical Institute (TurkStat), Eurostat Eurobase (last update: 01.03.2022), Department for Environment, Food & Rural Affairs of UK (DEFRA), Ministry for Development of Economy, Trade and Agriculture of Ukraine, FAO and PSD-online.

2022 yields come from MARS Crop Yield Forecasting System (output up to 10.03.2022).

EU aggregate after 1.2.2020 is reported.

N/A = Data not available.

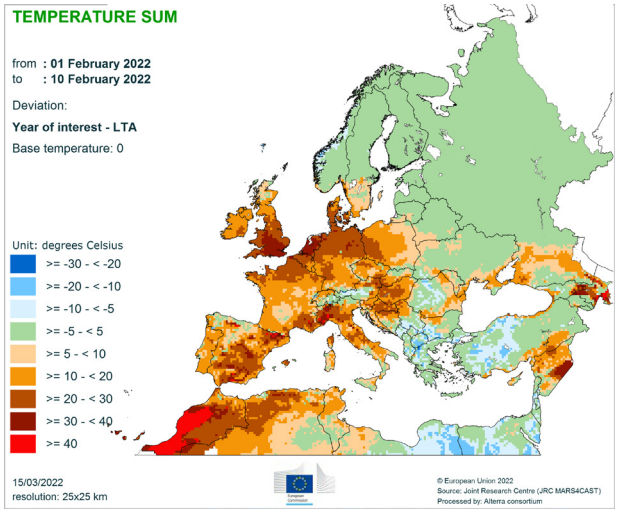
The column header '%22/5yrs' stands for the 2022 change with respect to the 5-year average(%). Similarly, '%22/21' stands for the 2022 change with respect to 2021(%).

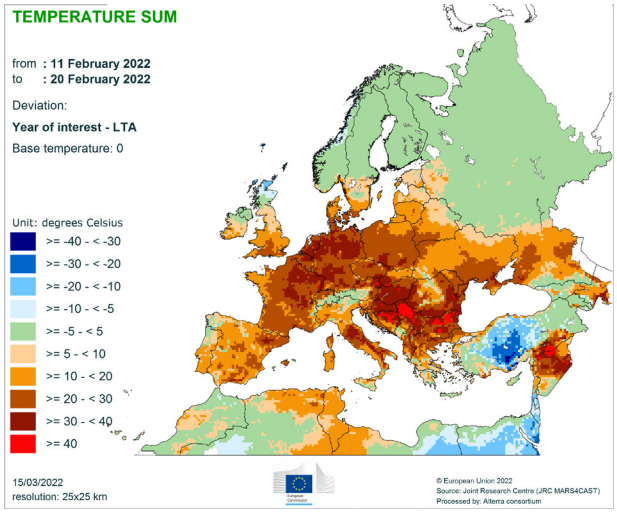
Cop name	Eurostat Crop name	Eurostat Crop Code	Official Eurostat Crop definition*
Total wheat	Wheat and spelt	C1100	Common wheat (*Triticum aestivum* L. emend. Fiori et Paol.), spelt (*Triticum spelta* L.), einkorn wheat (*Triticum monococcum* L.) and durum wheat (*Triticum durum* Desf.).
Total barley	Barley	C1300	Barley (*Hordeum vulgare* L.).
Soft wheat	Common wheat and spelt	C1110	Common wheat (*Triticum aestivum* L. emend. Fiori et Paol.), spelt (*Triticum spelta* L.) and einkorn wheat (*Triticum monococcum* L.).
Durum what	Durum wheat	C1120	*Triticum durum* Desf.
Spring barley	Spring barley	C1320	Barley (*Hordeum vulgare* L.) sown in the spring.
Winter barley	Winter barley	C1310	Barley (*Hordeum vulgare* L.) sown before or during winter.
Grain maize	Grain maize and corn-cob-mix	C1500	Maize (*Zea mays* L.) harvested for grain, as seed or as corn-cob-mix.
Green maize	Green maize	G3000	All forms of maize (*Zea mays* L.) grown mainly for silage (whole cob, parts of or whole plant) and not harvested for grain.
Rye	Rye and winter cereal mixtures (maslin)	C1200	Rye (*Secale cereale* L.) sown any time, mixtures of rye and other cereals and other cereal mixtures sown before or during the winter (maslin).
Triticale	Triticale	C1600	Triticale (x *Triticosecale* Wittmack).
Rape and turnip rape	Rape and turnip rape seeds	I1110	Rape (*Brassica napus* L.) and turnip rape (*Brassica rapa* L. var. oleifera (Lam.)) grown for the production of oil, harvested as dry grains.
Sugar beet	Sugar beet (excluding seed)	R2000	Sugar beet (*Beta vulgaris* L.) intended for the sugar industry, alcohol production or renewable energy production.
Potatoes	Potatoes (including seed potatoes)	R1000	Potatoes (*Solanum tuberosum* L.).
Sunflower	Sunflower seed	I1120	Sunflower (*Helianthus annuus* L.) harvested as dry grains.
Soybean	Soya	I1130	Soya (*Glycine max* L. Merril) harvested as dry grains.
Rice	Rice	C2000	Rice (*Oryza sativa*, L.).

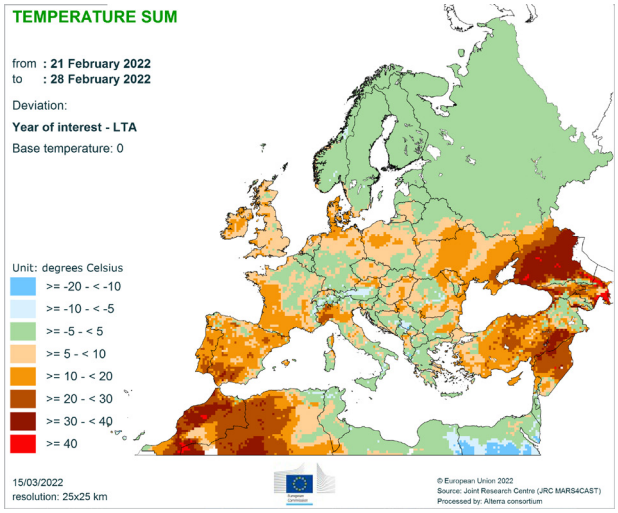
* *Source:* Eurostat - Annual crop statistics (Handbook 2020 Edition)

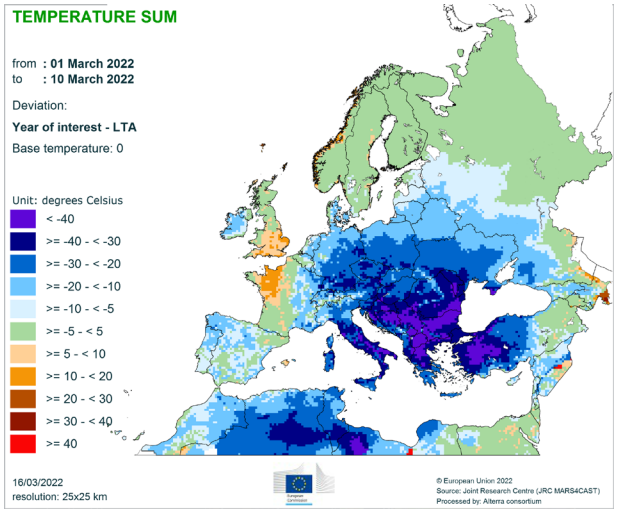
5. Atlas

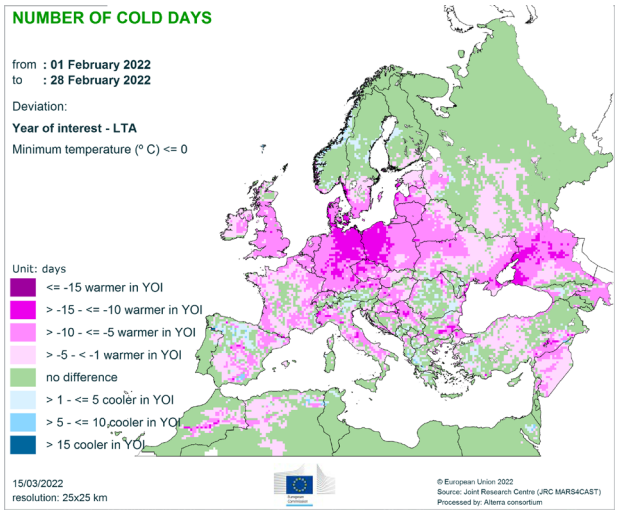
Temperature regime

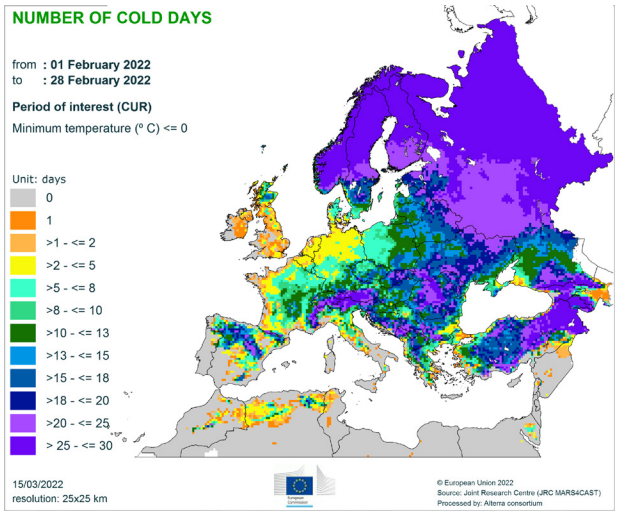


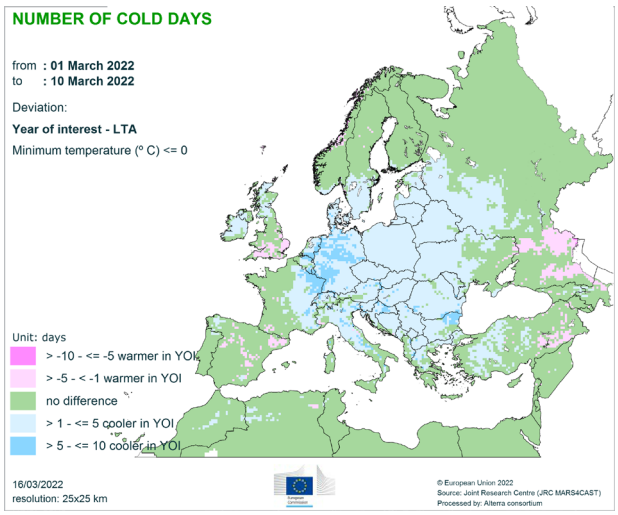


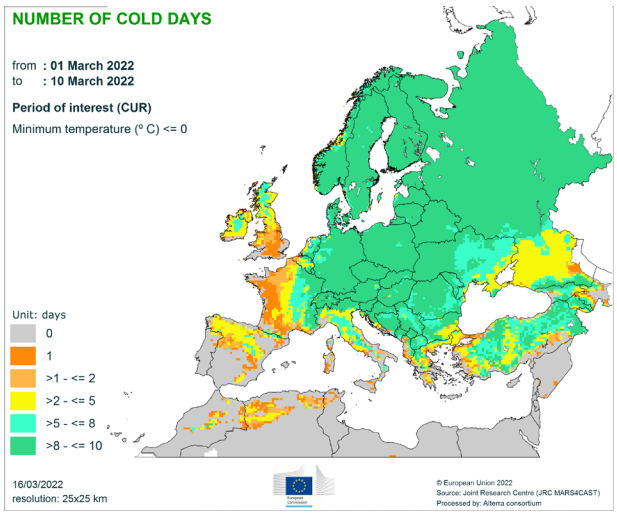




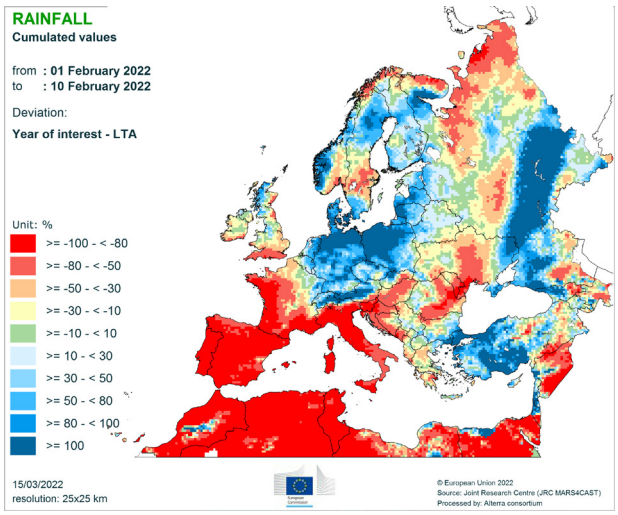


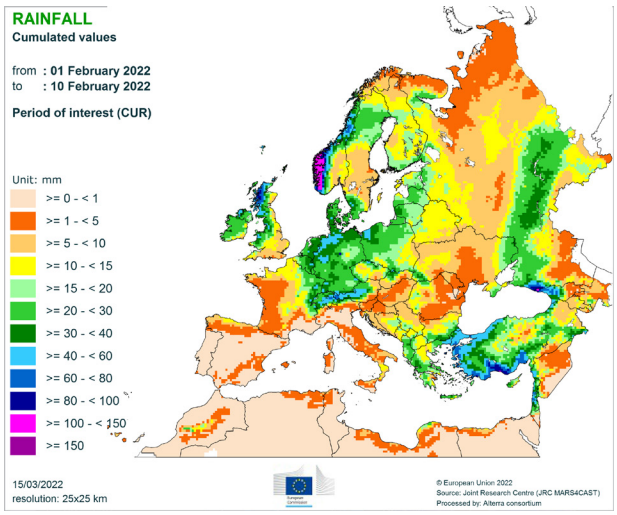


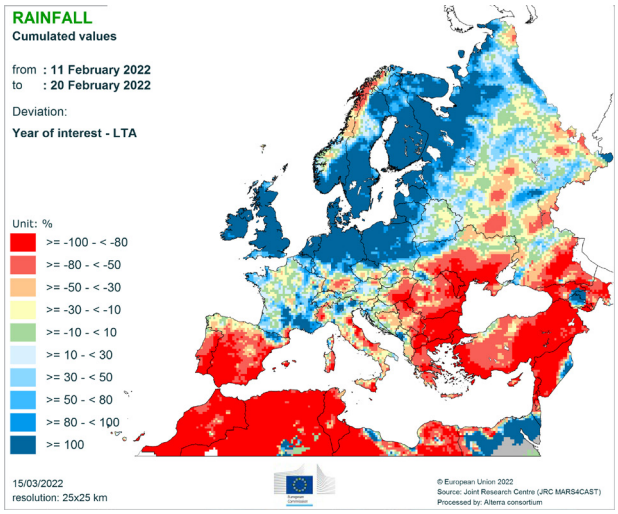


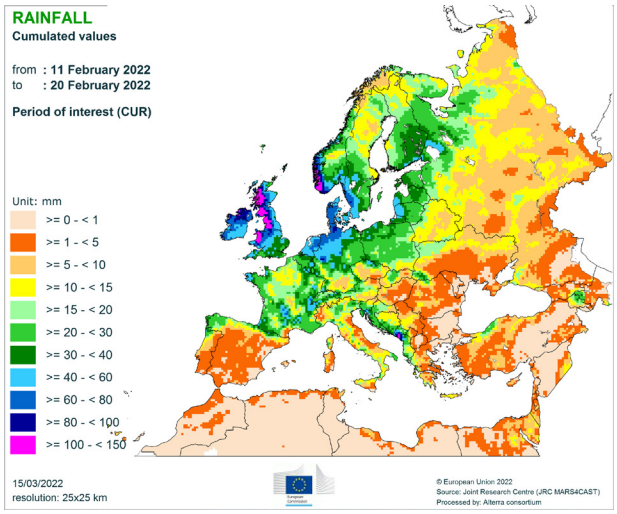


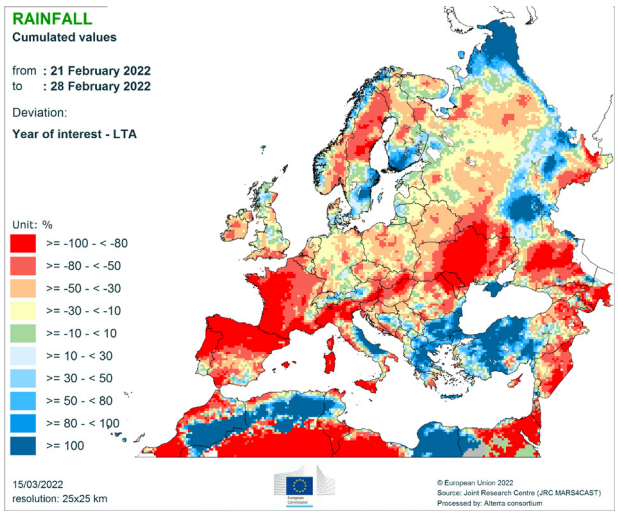
Precipitation

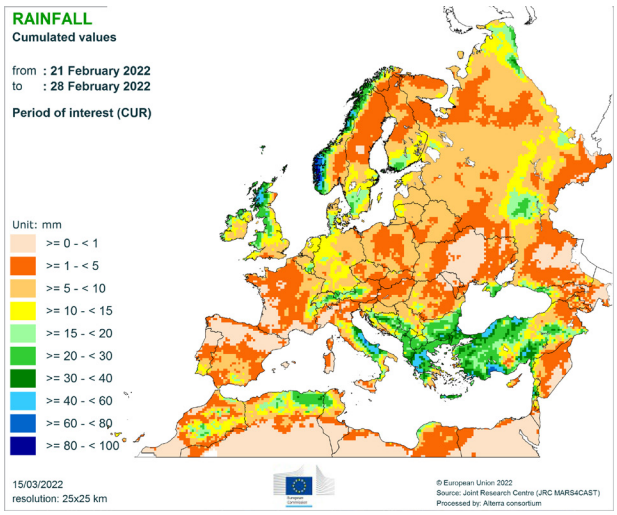


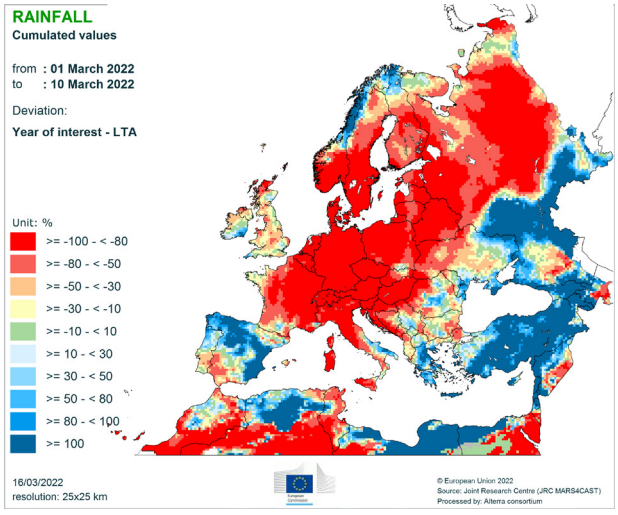


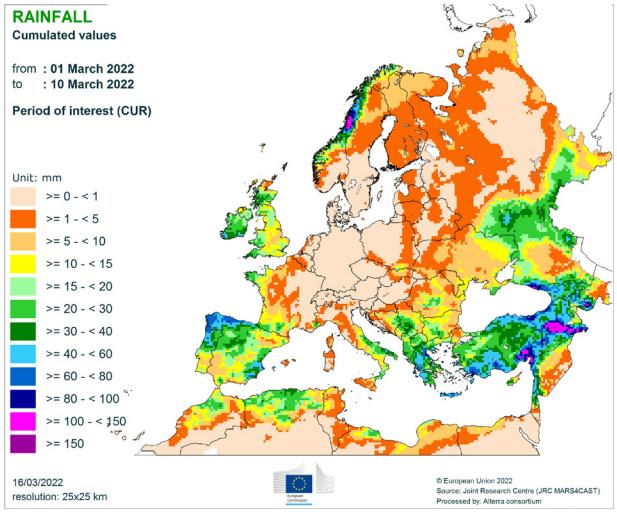


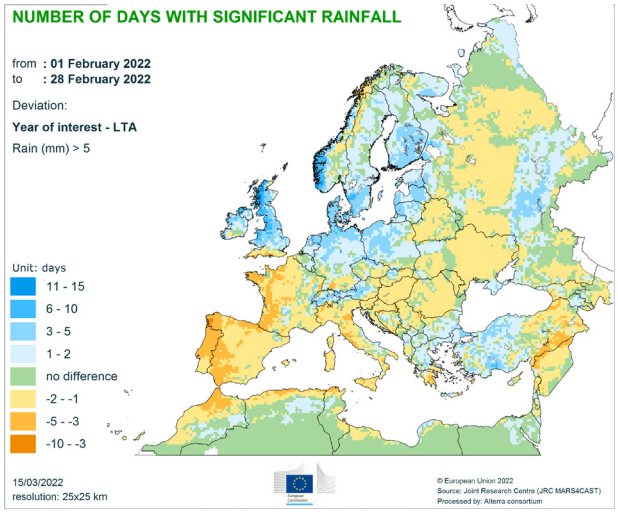


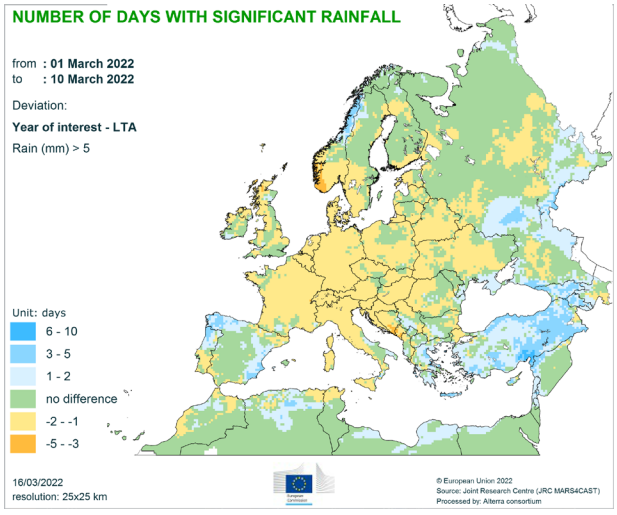

RAINFALL
Cumulated values
from : 21 February 2022
to : 28 February 2022
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
15/03/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 21 February 2022
to : 28 February 2022
Period of interest (CUR)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
15/03/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 March 2022
to : 10 March 2022
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
16/03/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


RAINFALL
Cumulated values
from : 01 March 2022
to : 10 March 2022
Period of interest (CUR)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 15
>= 15 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 60
>= 60 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150
16/03/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 February 2022
to : 28 February 2022
Deviation:
Year of interest - LTA
Rain (mm) > 5
Unit: days
11 - 15
6 - 10
3 - 5
1 - 2
no difference
-2 - -1
-5 - -3
-10 - -3
15/03/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
from : 01 March 2022
to : 10 March 2022
Deviation:
Year of interest - LTA
Rain (mm) > 5
Unit: days
6 - 10
3 - 5
1 - 2
no difference
-2 - -1
-5 - -3
16/03/2022
resolution: 25x25 km
© European Union 2022
Source: Joint Research Centre (JRC MARS4CAST)
Processed by: Alterra consortium

JRC MARS Bulletins 2022

Date	Publication	Reference
24 Jan	Agromet analysis	Vol. 30 No 1
21 Feb	Agromet analysis	Vol. 30 No 2
21 Mar	Agromet analysis, yield forecast	Vol. 30 No 3
26 Apr	Agromet analysis, remote sensing, pasture analysis, sowing conditions, yield forecast	Vol. 30 No 4
23 May	Agromet analysis, remote sensing, pasture analysis, sowing update, yield forecast	Vol. 30 No 5
20 Jun	Agromet analysis, remote sensing, pasture analysis, rice analysis, yield forecast	Vol. 30 No 6
25 Jul	Agromet analysis, remote sensing, pasture analysis, harvesting conditions, yield forecast	Vol. 30 No 7
22 Aug	Agromet analysis, remote sensing, pasture update, harvesting update, yield forecast	Vol. 30 No 8
19 Sep	Agromet analysis, remote sensing, pasture analysis, rice analysis, harvesting update, yield forecast	Vol. 30 No 9
24 Oct	Agromet analysis, pasture update, sowing conditions, harvesting update, yield forecast	Vol. 30 No 10
21 Nov	Agromet analysis, sowing update, harvesting update	Vol. 30 No 11
19 Dec	Agromet analysis	Vol. 30 No 12

Mission statement: As the science and knowledge service of the European Commission, the Joint Research Centre's mission is to support EU policies with independent evidence throughout the whole policy cycle.

PDF: KJ-AW-22-003-EN-N ISSN 2443-8278 doi:10.2760/888247

The JRC MARS Bulletin – Crop monitoring in Europe is a European Commission publication of the Joint Research Centre's AGRI4CAST project (JRC Food Security Unit – Directorate for Sustainable Resources)

JRC MARS Bulletins are available at https://ec.europa.eu/jrc/en/mars/bulletins

AGRI4CAST Resources are available at https://agri4cast.jrc.ec.europa.eu

Analysis and reports
B. Baruth, S. Bassu, W. Ben Aoun, I. Biavetti, M. Bratu, I. Cerrani, Y. Chemin, M. Claverie, P. De Palma, D. Fumagalli, R. Lecerf, G. Manfron, J. Morel, L. Nisini, S. Niemeyer, L. Panarello, G. Ronchetti, L. Seguini, A. Toreti, M. van den Berg, Z. Zajac, A. Zucchini

Reporting support
SeproTec, I. Biavetti, G. Mulhern

Edition
M. van den Berg, M. van der Velde, S. Niemeyer

Data production
AGRI4CAST (Food Security Unit JRC D5), Datameteo (IT)

Contact
JRCMARSBULLETIN@ec.europa.eu

Technical note
The long-term average (LTA) used within this Bulletin as a reference is calculated on the basis of weather data from 1991-2020.

Publications Office of the European Union